

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1
Telephone: WHitehall 9233 (12 lines) Telegrams: "Tazette, Parl, London"

BRANCH OFFICES

GLASGOW : 87, Union Street	Central 4646
NEWCASTLE-ON-TYNE : 21, Mosley Street	Newcastle-on-Tyne 22239
MANCHESTER : Century House, St. Peter's Square	Central 3101
BIRMINGHAM : 90, Hagley Road, Edgbaston	Edgbaston 2466
LEEDS : 70, Albion Street	Leeds 27174

Annual subscription £3 10s. 0d. post free. Single copies, One shilling & Sixpence
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Vol. 94] FRIDAY, MAY 18, 1951 [No. 20

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Passenger Fare Concessions

THE return of the holiday season is engendering the usual complaints of high passenger fares on British Railways, and suggestions from those not responsible for raising railway revenue (including, in last week's issue of *The Railway Revue*, Mr. S. D. Hoskins, a senior official of the National Union of Railmen) that lower standard fares and more cheap ticket and similar concessions would increase passenger revenue. The only evidence for this view, however convincing general observations as to half-filled trains, and so on, may seem to be, is that the Railway Executive is gradually, if cautiously, extending cheap ticket facilities, with delegation of responsibility to Regions to meet local needs. Against any considerable reduction in British Railways' fares is the evidence of the British Transport Commission Passenger Charges Scheme, 1951, to which we referred in our April 20 issue. In a statement published with the Scheme, the Chairman of the B.T.C., Lord Hurcomb, considers there are no grounds for assuming any improvement in railway passenger receipts, even if fares were lowered. Accordingly, although the B.T.C. seeks no increase in ordinary fares, which in 1950 yielded only 12 per cent. of total passenger receipts, it asks for power to raise monthly return tickets some 10 per cent.: the latter category is the basis of holiday traffic, and produced about one-third of total passenger revenue last year. This scepticism as to the efficacy of lowering fares for "ordinary" and holiday travel—quite

apart from the question of season tickets, which are to be raised—is justified by the latest available statistics, some of which are reproduced in this issue; despite the extension of cheap ticket facilities during the past year, with a rise of 26 per cent. over 1950 in passenger-journeys in this category in February, cheap ticket receipts during that month rose only 19 per cent., while total receipts fell slightly. The many critics of inadequate cheap ticket concessions, as Mr. David Blee, the Member of the Railway Executive responsible for commercial matters, has pointed out, fail to take into consideration the principle of uniformity in the granting of concessions, as well as high operating costs, return workings, and other factors in the complex process of fare fixing. The B.T.C., moreover, has had to be realistic; in seeking higher monthly return fares it has borne in mind the seasonal inability of road passenger undertakings to accept further peak period holiday traffic. How long, however, this seasonal excess of demand over the supply of transport will endure, is debatable.

Loss by C.I.E. Last Year

AT the Labour Court in Dublin, during an investigation of the wage claims of 3,450 men employed in the rail and road engineering shops of Coras Iompair Eireann, Mr. M. J. Hayes, Staff Relations Officer, C.I.E., reported that the undertaking had lost about £1,600,000 in the past year ended March 25 last. The claims would cost them £185,000 in a full year. Almost all of them amounted to 4d. an hour, to bring the rates up to 3s. 7d. Mr. Hayes said that the trade unions seemed to have the idea that C.I.E. could continue indefinitely with subsidies from the State. The wages bill was much higher than it ought to be; it had risen from £5,576,000 in 1947, for 22,043 employees, to £6,903,000 last year, for 20,871 employees. "If there is to be a rising impost of wages placed on the board, economies must result," declared Mr. Hayes, who added, "Increases in fares and charges would appear to be inevitable." The findings of the Court will be announced.

Joint Engineering Conference in London

THE interdependence of all branches of engineering, and the close working arrangements now existing between members of the three major engineering institutions in Great Britain, will be emphasised at a joint conference to be held in London next month. The inception of this conference, further details of which are given in other pages this week, was stimulated by the Festival of Britain project and will be influenced by its objective of recording the contributions to the advancement of civilisation made by British engineers and scientists in the past hundred years. Papers to be read will cover a wide field, including all forms of transport, and they are to be presented in abstract so that the major portion of each session can be devoted to a discussion of the subjects under review. Railway mechanical engineering will be dealt with in a contribution by Mr. R. A. Riddles, and the subject of permanent way developments in Great Britain will be covered by Lt.-Colonel H. B. Everard. Mr. C. M. Cock will read a paper covering electric traction and signalling matters, while underground railway planning and construction will be described by Mr. D. Anderson, and Mr. J. S. Campbell will discuss railway bridges. The programme will also include a number of social functions and visits to works.

Labour Relations on U.S.A. Railways

THE great differences between British and American railways as regards labour relationships and negotiating machinery are shown by Mr. C. E. R. Sherrington, Director of the B.T.C. Research Information Division, in an article in the current issue of the *British Transport Review*.* Although the number of railway employees is 1,200,000, or only twice that of British Railways, there

* Labour Relationships on the American Railways. *British Transport Review*, April 1951. London: British Transport Commission. 5s. Broadway, S.W.1. Price 1s.

are 120 Class I railways (those earning at least \$1,000,000 a year) and over 20 labour organisations, roughly divided between operating and non-operating staffs; there is no "closed shop." The Railway Labor Executives' Association, founded some 20 years ago to co-ordinate the efforts of the unions in matters of mutual concern, embraces 80 per cent. of all railwaymen in the various organisations; a similar body might be helpful in this country, where the conflicting claims of only three railway unions have complicated labour disputes. It does not seem that the somewhat elaborate legislation and negotiating procedure outlined by Mr. Sherrington have been very successful in preventing strikes. Against this, rises in living costs have been spectacular in recent years; also, the dramatic nature of Government emergency control during strikes may give an exaggerated impression of the seriousness of the situation. Despite recent unrest, it is clear from the performance and increasing efficiency of U.S.A. railways that there is very little wrong with the morale of American railwaymen.

Irish Railway Orders for Continent?

THE possibility of orders for railway equipment being placed on the Continent by Coras Iompair Eireann (the Irish Transport Company) has resulted from a recent visit to France by Mr. T. C. Courtney, Chairman, Mr. J. O'Farrell, Director, Mr. O. V. Bulleid, Chief Mechanical Engineer, and Mr. D. Herlihy, Chief Engineer. The primary objective of the visit was to study French railway methods with special reference to railcars, and also to ascertain whether France could sell railcars at prices comparable to those of British products, and, if so, whether the French cars could be delivered speedily. Since the visit, Mr. George Howden, the General Manager of C.I.E., is reported as having said that the French cars which had been inspected were up to the British standard, but although full details of cost were not yet available it looked as though they would be more expensive. He added that C.I.E. would also explore the possibility of making purchases in Germany and Italy. Mr. Courtney has let it be known that, apart from railcars, the Irish delegation investigated French methods of manufacturing, maintaining the permanent way, and engineering practices in general. Mr. Bulleid is reported to have gone on from Paris to Switzerland to study Swiss methods of railway carriage and wagon construction.

Overseas Railway Traffics

AS a result of a £865,000 advance in working expenses during March, a £759,000 improvement in Canadian Pacific gross earnings was offset by £106,000, and net earnings for the month fell from £1,088,000 for 1950 to £982,000. Gross earnings for March were £11,502,000 and working expenses amounted to £10,520,000. On the aggregate C.P.R. gross earnings for the current 13 weeks are up by £5,010,000 at £32,736,000 and net earnings are £2,025,000 as compared with £454,000 for the equivalent period of 1950. During the fortnight ended May 4, Antofagasta (Chili) and Bolivia Railway traffics rose by £103,710 to £250,580 and had made an aggregate improvement of £731,170 at £1,872,240. There was a substantial decline in International Railways of Central America operating revenues for March, as a result of which total operating revenues for the current 13 weeks have fallen below those for the same period last year. Operating revenues for March were down by \$106,082 at \$1,204,306, and on the aggregate are \$25,546 lower at \$3,753,109.

British Transport Commission Statistics

DESPITE the passenger train cancellations to save coal, British Railways total passenger journeys during February, 1951, were only 0.6 per cent. down on last year, with rises of 26 per cent. in excursion and other cheap ticket journeys (largely because of the additional facilities provided), and of 43 per cent. in full fare journeys, with a 37 per cent. fall in monthly return fare bookings.

During the roughly corresponding statistical Period 2 (January 29-February 25), passenger train-miles were 7.2 per cent. down on 1950; during Period 3 (to March 25), they were 9.2 per cent. down. The total tonnage of British Railways freight traffic for Period 3 was 2.2 per cent. below that of last year, with decreases of 3.6 and 4.5 per cent. in merchandise and mineral traffic respectively—which may have been slightly affected by the incidence of Easter. Total freight train-miles also were down 2.2 per cent. on Period 3 of 1950. Total ton-miles were one per cent. up, with a 5.2 per cent. increase for coal, and decreases of 2.3 and 2.6 per cent. respectively for merchandise and minerals. Total wagon-miles decreased by 3.9 per cent. compared with 1950; loaded wagon-miles fell by 2.9 per cent., with a rise of 2.8 per cent. for coal, and decreases of 4.9 and 6 per cent. for merchandise and livestock, and for minerals respectively.

Where Passenger Traffic Loses

IT is fashionable in the United States to attack streamline passenger train enterprise on the ground that high freight rates are being used to meet mounting passenger traffic deficits. A recent editorial in the *Railway Age* exposed the falsity of this claim and pointed out that the arbitrary basis on which the Interstate Commerce Commission apportions working costs, as between freight and passenger traffic, results in much of this deficit being more apparent than real. In 1949, for example, the Santa Fe, which operates a number of high-speed streamline services, was shown to have lost \$30 million in passenger operation, when actually its revenue from passenger service had exceeded out-of-pocket costs by \$23 million. A real cause of deficit in passenger working, amounting in 1949 to nearly two-thirds of the deficit figures published, is the "head-end" traffic which American railways are compelled to carry in passenger trains—mail, "express," baggage, milk, and so on—at rates which cannot compensate the railways for the work involved. Some 60 per cent. of the 1949 deficit was attributable to this cause, and this has increased since the Federal Government diverted an amount of traffic from "express" to the mails by a generous increase in the permissible size and weight of parcels.

U.S.A. Streamliner Success

A YEAR ago the Wabash Railroad introduced a new "Blue Bird" streamline train with diesel haulage between Chicago and St. Louis. There are three competing routes between these cities. Hitherto, the other competitors, with five day streamline trains in each direction—routes well adapted to high speed and each serving a number of intermediate cities—carried the bulk of the traffic. The Wabash, losing by its circuitous entry to St. Louis, and with Decatur as its only important intermediate stop, nevertheless gains an advantage in being able to stop its trains at Delmar Boulevard, adjacent to the residential areas of St. Louis. Once clear of St. Louis the "Blue Bird" runs the 270.8 miles to Englewood outside Chicago in 258 min. The new train, which makes the return journey of 571.4 miles daily, was re-equipped from February 26, 1950, with new stock, including a 2,000-b.h.p. diesel-electric locomotive, which has permitted a reduction in fuel cost on the run by 51 per cent. and in locomotive repair cost by 47 per cent. New patronage has been traced to the introduction of the new stock and the combined earnings of the three trains in each direction daily have increased by 17 per cent. at a time when passenger revenues in general in the Mid-West have been on the decline.

Preventing Rail Corrosion

THERE are certain atmospheric conditions in which the life of steel rails is likely to be shortened more by corrosion than by wear. Apart from loss of cross-section, and thereby of strength, corrosion pitting is liable to form the starting place of cracks which may result in premature failure of the rail. Such conditions are worst in tunnels, especially those in which sulphur from steam locomotive exhaust combines with damp to encourage a weak sulphuric

acid attack, and also in coastal areas. Recently the Great Northern Railway, U.S.A., which has a considerable mileage of line bordering the Pacific seaboard, has put in service mobile equipment for applying anti-corrosion treatment to rails. An old motor car has been adapted to carry two oxy-acetylene flame-cleaning heads, which simultaneously clean both sides of both rails of all mill-scale and rust as the car is hand-propelled forward; men follow to brush away the loosened material; the final operation is that of spraying both rails by means of paint guns carried on a trolley, with a corrosion-resisting compound that is claimed to have high adhesive qualities and to resist cracking, chipping, and peeling. The gang has treated an average of 3,430 ft. of single track a day, at an average cost of \$700 a mile.

Diesel Railcar Economy

AN interesting passenger train innovation in the United States attracting much attention is the new Budd "RDC" type diesel railcar, with hydraulic transmission. Absence of an electrical transmission makes both for an inexpensive unit and also for maximum revenue space, as the power plant is placed beneath the floor, enabling the 85 ft. car to seat 89 passengers in comfort. The rate of acceleration is high, and with a cruising speed of 70 m.p.h. cars can be worked to fast schedules. As they can be operated with a crew of two only—driver and conductor—coupled with low fuel cost, these are exceptionally economical to run by American standards. In the first six months operation by the Boston & Albany subsidiary of the New York Central system of two of these railcars between Boston, Worcester, and Springfield, passenger traffic has increased by 40 per cent., some taken over from other trains but much from competing bus lines. The two cars have been running 800 miles between them at a total fuel cost of \$15 daily. Operation has cost 57·8 cents a mile.

Saddle Tank Engines for Steelworks

THREE saddle tank shunting locomotives for the Steel Company of Wales Limited have recently been completed by W. G. Bagnall Limited. These engines, which are described and illustrated elsewhere in this issue, will be required to haul seven ladle cars of 65 tons gross weight each up an incline of 1 in 100 in the steelworks at Margam, and they have been designed to provide maximum availability. The frame plates are $1\frac{1}{2}$ in. thick, suitably stayed, and the buffer beams are 3 in. thick and extend to within 5 in. of rail level. One feature of the design is the provision of single, double-row, self-aligning roller bearing axleboxes, the coupling rods, connecting rods, and eccentric rod big ends also being fitted with similar roller bearings. Manganese-steel liners are fitted to the cast-steel axleboxes and axlebox guides. Outside cylinders are fitted, and steam distribution is effected by Walschaerts valve gear.

Summer Train Services, Southern Region

THREE are no changes of note in the Southern Region Summer timetables, which will operate from June 18, but some minor improvements will be effected. Three of the afternoon and evening expresses from Waterloo to the Bournemouth line are to be accelerated, the 3.20 p.m. by 6 min., the 4.35 p.m. ("Royal Wessex") by 8 min., and the 6.30 p.m. by 10 min.; to Bournemouth Central the two former will take 2 hr. 20 min., and the last-mentioned 2 hr. 11 min. In the reverse direction the "Royal Wessex" (8.40 a.m. from Bournemouth Central) is to be accelerated to reach Waterloo at 10.50 a.m., and will be the only train of the day to make the journey in 130 min. inclusive of two stops (Southampton Central and Winchester). The 12.40 p.m. from Bournemouth Central is to be accelerated 7 min., and the 2.38 and 6.37 p.m. by 5 min. each, bringing their times to Waterloo down to 129, 134, and 135 min. respectively. An interesting development on Saturdays is that the 9.17 and 10.38 a.m. from Waterloo to Swanage this year are to avoid

Bournemouth by taking the Ringwood route, and similarly with the 11.34 a.m. and 1.33 p.m. from Swanage. A curious but customary feature of the summer service is five non-stop trains on Saturdays from Bournemouth Central to Waterloo, but none in the reverse direction.

On the West of England main line a relief is to run at 10.15 a.m. on Mondays, Fridays, and Saturdays to the 10.30 a.m. from Exeter Central to Waterloo; on Mondays and Fridays this will call at Templecombe and Salisbury only, and the through Torrington and Ilfracombe sections of the 10.30 a.m. will reach Waterloo 33 min. earlier, at 1.37 p.m. The 10.30 a.m. will call additionally at Woking, and arrive 5 min. later, at 2.15 p.m. A 2 min. acceleration of the first section of the "Atlantic Coast Express" will introduce an 88 min. booking over the 83·8 miles from Salisbury to Waterloo (57·1 m.p.h.), the fastest since the war between these points.

On the Central Section, certain gaps in the regular interval services between Victoria and the South Coast, which have persisted since the war, are now to be filled up; these include the 60 min. non-stop 1 p.m. and 9 p.m. trains from Victoria to Brighton and the 12.25 and 10.25 p.m. from Brighton to Victoria throughout the week; the 2.18 p.m. from Victoria to Bognor Regis and the 5.55 p.m. in the opposite direction; the 7.36 p.m. from Eastbourne to Victoria and the 12 midnight from Victoria to Brighton and also to Eastbourne and Hastings, dividing at Haywards Heath. On the Eastern Section, the "Thanet Belle", renamed the "Kentish Belle", from Mondays to Fridays is to convey through Pullman cars for Canterbury, and will call additionally at Faversham to detach and attach this portion; leaving Victoria at 11.30 a.m., Canterbury passengers will reach that city at 1.6 p.m.; they will return at 5.30 p.m., and be due in London at 7.5 p.m.

There is to be a lavish provision of through trains on Friday nights and Saturdays between the North and Midlands and the coast resorts of Kent, Sussex, and Hampshire. Saturday services additional to those of last summer will be the 6.5 a.m. from Birmingham (Snow Hill) to Bournemouth, the 9.5 a.m. from Birmingham to Portsmouth, the 12.55 a.m. Leicester Central to Margate, the 9.42 p.m. (Friday nights) from Newcastle to Bournemouth, and corresponding return trains.

A Tribute to the Technical Press

THE circulations of trade and technical publications have to be based on the general interest of their readers and on the earnest search for greater knowledge and improved and more profitable techniques. In recent years there has been a very considerable development in the responsibility and standing of the technical press of this country. A number of publications, such as this journal, have long enjoyed a world-wide circulation and reputation. Others, more restricted in their sphere of circulation and influence, nevertheless have obtained a very high standing among those to whom the appeal is made.

A recent issue of *Business Ahead*, a survey of market conditions, resources, and influence published by Saward Baker & Co. Ltd., deals at some length with the development, functions and merits of the British trade and technical press, more particularly from the viewpoint of the advertiser. The survey is of greater interest because the firm producing it enjoys a high reputation as a practical advertising agency of wide experience and because of this is able to form a balanced judgment of the respective and often divergent values of the many advertising media now available.

The survey finds that in no field of British journalistic production has there been so great a change in recent years as in that of the technical journal. About two decades ago, Britain, one of the greatest industrial nations of the world, if not the greatest in almost every field of industrial endeavour, lagged behind in the level of her technical journals. So great has been the transformation that where we then followed far behind many of our American and Continental contemporaries, we now lead by a distance far greater than that by which we previously lagged. What

this change has meant to Britain's industrial prestige in the past, and what it means to-day and must mean in the future is beyond estimate.

It is now the order rather than the exception for the British technical press to be studied assiduously by its foreign rivals and it is gratifying to note the frequency with which whole pages of highly technical editorial matter are bodily lifted. "What this great change means in terms of increased trade is hard to estimate, indeed hard to over-estimate. The high level of the editorial contents together with the quality of production and the high standard of advertising—technical advertising which very often, incidentally, is unequalled abroad—are doing much to build and sustain the prestige of British industrial progress the world over. It is nothing short of fact that the growth of British world export, based on technical superiority, owes much to the changed attitude of the overseas buyer to British technical skill which, in turn, is largely due to the enviable standard of her technical journals," it is stated.

In seeking to trace the reasons for the change, it is held that much is due to a major change in the outlook of those who control the technical press. A reputable editor will no longer be content to "lift" from overseas journals or to reprint technical papers long after they have been delivered at meetings of learned societies. The speed of the daily paper is now the standard, and there is keen and healthy rivalry among the editors to be the first with the news. In keeping an expert eye on all events affecting the industry, these editors are always prepared to commission costly theses of original and informed material or even bring from abroad the man who has the information. The editorial staffs must be capable of discerning reliable and original technical information and of keeping in close touch with all new development within the industries concerned. It is because they do their job so effectively that many British technical journals are now highly valued, both at home and abroad, for their original research material—photostat copies of which are in regular demand by industrialists and their research staffs. This itself is a clear reflection of a journal's reputation and importance.

From the author's point of view, if he has information to give, he would rather give it to a journal to-day for instant publication to a world-wide readership than wait until the opportunity may arise of presenting a paper, to be discussed and eventually reprinted. The writer of standing will only entrust his findings to a journal whose status within the industry is such as will enhance his own reputation.

Financial Recovery of U.S.A. Railways

IN our April 20 issue we directed attention to the remarkable financial recovery of the U.S.A. railways in January. A number of sporadic strikes among some grades of operating employees early in February retarded progress, but the table below shows that results were better than they were in the previous year, when labour troubles were prevalent in the coal-mining, motor-manufacturing and other basic industries.

	February, 1951	February, 1950	Percentage increase
	(Millions)	\$	
Operating revenues	716	585	22
Operating expenses	610	501	21
Taxes	71	56	28
Net railway operating income (earnings before charges)	18.9	14.7	28

The disturbed conditions in February hit the eastern railways hard. The operating ratio of the Pennsylvania rose to 103 per cent., and left the system with a deficit of \$7.7 million, which wiped out its net railway operating income for January. In the two months the Pennsylvania spent \$40 million on maintenance of equipment, nearly 13 per cent. of the total expenditure of all U.S.A. railways under that head. The New York Central working expenses were high also and it finished February with a deficit of \$8 million. The railways in the Western District did better. Keeping its operating ratio down to 78 per cent., the Santa Fe brought its operating income for

January and February to \$9.8 million. The Southern Pacific held second place with a return of over \$7 million. The freight revenue of these two Western lines is increasing by leaps and bounds. Their passenger revenues, however, are less than the amount of the Federal and State taxes which are imposed on their properties.

For January and February, the U.S.A. railways estimate their net income, after charges, at \$53 million, compared with \$5 for the first two months of 1950. Provided that the operating ratio of the whole system can be held down to a reasonable level, say 85 per cent., prospects are favourable. In the first quarter of 1951, wagon loadings were 16 per cent. over 1950 and 6 per cent. over 1949. During the second quarter, they are expected to exceed last year's loadings by 6.5 per cent.

In March the railways were short of 20,000 wagons every day towards the end of the month. Steps have been taken to make effective use of the existing wagon stock and the number of serviceable wagons in traffic is increasing month by month. The monthly output of new wagons is budgeted to reach 10,000 in June. If that goal is reached, the railways should be able to cope with any large volume of traffic which may originate later in the year.

The Fire at Beattock

THE fire which broke out and spread with alarming suddenness in a main line train near Beattock Summit on June 8, 1950, and led to the loss of five lives, naturally gave rise to some public concern, coming comparatively soon after the serious fire at the Penmanshiel tunnel on June 23, 1949. Colonel R. J. Walker, who inquired into both, had to investigate the matter with special care and hear much evidence as well as the opinions of medical and other experts. His report is necessarily lengthy, but elsewhere in this issue we publish a summary which contains his main recommendations and suggestions.

Fire anywhere is highly dangerous, but particularly when it occurs in the confined space of a railway carriage which may be moving rapidly and where there is almost always plenty of draught to fan the flames. It is also frightening, and can lead easily to hasty or ill-considered actions, if not panic, more readily than other types of railway accident. Heat and fumes can overcome persons surprisingly quickly at such times. Much depends on the ability to act swiftly yet calmly, and on the provision of adequate means of escape and of bringing the fire under control or isolating it, at least sufficiently to eliminate risk of death and serious injury.

Fires in trains are not frequent, but the risk is ever present and if one breaks out there is generally every chance of most serious results. At both Penmanshiel and Beattock the vehicles were enveloped in a few moments, and even if the train crews—which in both instances acted with creditable promptness—had had several extinguishers immediately at hand they could have exerted no appreciable influence on the course of events. The rapid spread of the flames at Penmanshiel was found to be due to the use of a certain type of lacquer in the finishing of the vehicles, and energetic measures were at once taken to find all other vehicles similarly treated and remove it. This process is being continued as rapidly as possible.

The fire at Beattock was in a different category and presented unusual features. It did not originate in the compartment where the deaths occurred. The unfortunate passengers were found lifeless in restful attitudes and showed no sign of having struggled or attempted to escape. Two had not been in the compartment a few moments before, and one of those was not even in the same coach. The fire had started two compartments away, in one which had been unoccupied for some time and was closed up. It had been set going by a careless smoker, whose lighted match or cigarette end had ignited rubbish at the back of a seat. The smouldering and burning slowly built up an explosive mixture which, when a window gave way from the heat, was set in action, and the blast killed the five victims instantly, who, doubtless knew nothing of their end. As mentioned, the situation was handled at once

with initiative and energy, and high praise is given in the report to all concerned.

Colonel Walker debates the question of the general design of rolling stock, with the aim of avoiding fires of any type in future and providing better facilities for emergency escape should one break out. Examination of coaches similar to those destroyed at Beattock showed that rubbish could accumulate behind the heaters in a position where it was difficult to clean effectively. Colonel Walker considers that the best way of dealing with this situation would be to make the seats removable. Disadvantages would be outweighed by the ability to clean thoroughly behind the seats. It has been decided already to apply asbestos boarding where the floor meets the wooden partition, with wire mesh grille to limit the rubbish that can enter below the seating. If the seats are not removable this would not, Colonel Walker believes, be sufficient, and would have the serious disadvantage that dust could collect where it could not be reached at all. If there are no heaters, or they are so placed that there are no cleaning difficulties, the seats need not be removable.

On the general construction of vehicles, his report stresses that present-day designs are the outcome of years of experience and should not be hastily criticised. Further, it is wiser to avoid radical changes, or too ready adoption of the latest methods used elsewhere, until they have proved themselves beyond possibility of doubt. It also emphasises that to discuss all the arguments for and against the main forms of vehicle would be lengthy and anything short of that misleading. The principal point dwelt on is therefore that as long as wooden interiors continue to be used in coaches, there must remain some possibility of fire, certainly not negligible.

Had certain points been foreseen originally it is probable that this fire would not have occurred. As regards the use of certain kinds of materials such as lacquers, it is now agreed that this has involved mistakes, and steps are being taken accordingly. Colonel Walker thinks it is important to consider whether means of emergency exit are adequate. In new standard designs they can be so regarded, as far as the corridor itself is concerned, but the only way out of a compartment if passengers are caught in it is through the ventilator over the window, unless the window can be broken, when there is risk of injury from jagged glass. It is not easy, without affecting amenities and comfort disproportionately, to suggest a practical remedy, as many factors bear on the problem. The report suggests that some compromise between British and Continental methods might be feasible in the form of a lower part to a window, made to be fully lowered or discarded in emergency only. It is recommended that the Railway Executive should study the whole matter of providing more means of escaping in serious need from compartments of coaches with wooden or other inflammable interiors. Sleeping cars present greater difficulties as there is more inflammable material in them than in other vehicles. With a blocked corridor there is no escape except by breaking a window, and with one end of a corridor blocked there is grave risk of passengers being caught and overcome while endeavouring to reach the other. It is Colonel Walker's opinion that such cars, but especially the third-class, which can carry up to 28 passengers, are not sufficiently provided with means of exit and that this should be rectified in new building by providing an intermediate door in the corridor and some means of lowering windows in emergency. He recommends also that all corridor vehicles carry an extinguisher and steps be taken to institute regular fire fighting procedure, so that every member of a train crew will know what he is expected to do in an outbreak.

These recommendations will be duly considered by those responsible and, whatever view may be taken of them, it will not be denied that a fire in a train is extremely grave, easily leading to calamitous consequences. Nor can one dispute Colonel Walker's observation that all reasonable steps to remove risk of fire should be taken or, where it is impossible to do that completely, to ensure that the effects of a fire shall be mitigated to the maximum practicable extent, without giving undue weight to the expense involved.

South African Railways & Harbours

THE report for the year ended March 31, 1950, of the South African Railways & Harbours, which we have received from Mr. W. Heckrodt, the General Manager, reveals further records in the volume of traffic handled, notably 58,671,684 tons of goods carried—a figure presumably including livestock as the figure given for goods and coal is 57,941,315 tons—as compared with 55,322,965 for the previous year; 255,775,851 (against 254,454,741) passenger journeys; 4,946,619 (4,783,184) truck loadings in terms of short vehicle; and 107,430,875 (104,482,681) train- and engine-miles.

The increased tonnage was spread over all classes of goods carried, and was due largely to rapid industrial development. Coal and manganese exploitation was especially notable, and the quantity of the latter carried by rail increased by 107 per cent. over the 1948-49 figure. The phenomenal increase in suburban passenger traffic continued, the number of passengers carried on the Reef alone being 107,231,409, a figure 318 per cent. greater than that recorded 15 years earlier.

In addition to the increased traffics, the general rise in tariffs and charges of about 7½ per cent., dating from April 1, 1949, further improved revenues from all main services except harbours, which showed a decrease of £633,166. Despite a continuation of the intensive economy campaign, working expenses suffered a serious rise due to enhanced prices of materials, maintenance and operating costs. Consequently, the net result of the final working of all services was a deficit of £3,295,620. Details of the traffic and financial results are given below:

	1948-49	1949-50
	Thousands	Thousands
Railways		
Passenger journeys ...	254,455	255,776
Goods tonnage conveyed ...	54,671	57,941
Passenger train-miles ...	21,907	21,774
Mixed ...	5,599	6,005
Goods ...	53,432	55,448
Total ...	80,938	83,228
Total ton-miles ...	11,358,480	12,438,371
	<i>£ thousands</i>	<i>£ thousands</i>
Railways		
Passenger receipts ...	13,456	13,912
Parcels and mails receipts ...	2,272	2,277
Goods, coal and livestock receipts ...	53,104	58,014
Miscellaneous receipts ...	2,360	2,549
Total receipts ...	71,192	76,752
Working expenses ...	52,407	54,016
Depreciation ...	4,492	3,116
Total expenditure ...	56,899	57,132
Surplus ...	14,293	19,621
Interest and other charges (net) ...	20,387	24,038
Net deficit on railways ...	6,094	4,417
Harbours		
Revenue ...	5,995	5,361
Expenditure ...	3,557	3,678
Steamships		
Revenue ...	335	451
Expenditure ...	478	535
Airways and Airports		
Revenue ...	3,406	3,538
Expenditure ...	3,048	3,554
Deficit on all services ...	3,441	2,825
Net-revenue appropriations ...	500	461
Deficit on all services ...	3,941	3,296

The report describes the inauguration of the Voortrekker Monument near Pretoria and the heavy traffic carried in connection with its celebrations. Other salient references are to the Central & Southern Africa Transport Congress, through traffic with the Rhodesias and other northern territories, visits of railway missions from Australia, and damage due to washaways in South West Africa.

On March 31, 1950, the administration operated 13,149 route-miles of 3 ft. 6 in. and 793 of 2-ft. gauge, or 13,942 route-miles in all, including 580 for the Rhodesia Railways. Of the 100 Class "24" branch line locomotives on order from the United Kingdom, 97 were delivered during the year to complete the order. Early in 1950, the 2,000th locomotive delivered to South Africa by the North British Locomotive Co. Ltd., was named and placed in service with appropriate ceremony. Twelve "S-1" engines were built departmentally, and 190 coaching and 8,162 goods vehicles were brought into use. In Natal, the electrification of a 22-mile section of line was completed, and in the Transvaal 12 miles of track were electrified during the period under review.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Railways of North Africa

April 11

SIR.—Having been in North Africa during World War II, where I was involved in railway communications and signaling work with the U.S. Military Railway Service, I was particularly interested to note your article, "The Railways of North Africa—Impressions of a Recent Tour," in the February 23 issue.

This was a nice article on the subject.

Yours very truly,

MAURICE PEACOCK,
Associate Editor, "Railway
Signaling & Communications"

Simmons-Boardman Publishing Corporation,
79, West Monroe Street, Chicago 3

British Modern Lightweight Coaches for Indian Railways

May 9

SIR.—We have to refer to the article, "Lightweight Coaches for Indian Railways," published in your April 27 issue.

As builders of the trailer coaches referred to in this article we would draw attention to an error on page 470 in the general particulars of the coaches. The weight of a trailer coach is indicated as 31 tons. Actually the weight of a trailer coach for lower class passengers is 27 tons, and for the upper class passengers 27 tons 14 cwt. As the weight of the old type trailer coaches was 43 tons, this represents a saving of 35·5 per cent. and 37 per cent. respectively.

Yours faithfully,

H. J. S. MOYES,
Managing Director

The Birmingham Railway Carriage & Wagon Co. Ltd.
Smethwick, 40

Railway Efficiency

May 1

SIR.—Although my experience as a professional railway traffic man dates from 1895, and covers service on the railways of three continents, Mr. J. H. Laundy has so poor an opinion of my knowledge and views that he classes me with himself as a mere amateur.

In disputing my contention that passenger traffic had declined by about 50 per cent. since 1913, he claims that it had actually increased by 13 per cent. by 1949. Then how does he explain the fact that, between those years the number of coaches declined from 70,000 to under 40,000? Mr. Laundy also claims that the accountants have nothing to do with the rates and fares policy. Who, then, are the members of the Rates Tribunal, and who are the people now preparing the new schedules?

In challenging me to say where the "few men with commonsense and enterprise could be found to capture all the competitive traffics from the roads," he reveals that he does not doubt the capabilities of the practical staff. In the old days, when the railways were prosperous and paid good dividends, nearly all the responsible positions—general managers, traffic superintendents, goods and mineral managers, etc.—were filled by first-class station-masters, with around 30 years hard experience, any one of whom possessed a far better all-round knowledge of the many aspects of the working than all the present accountants, lawyers, university theorists, and other "experts" put together. From their ranks have come some of the greatest railwaymen in the world. For over 25 years, my own chief was recognised as the greatest traffic superintendent in all South America.

In one of your recent issues it was stated that American railways also select as their presidents, vice-presidents, and so on, only men who have risen by their own merits from junior positions at stations. From their ranks came Sir

Eustace Missenden, and I assure you, Sir, that there are still just as good fish in the sea as ever yet came out of it. But, of course, they are ignored because the aforesaid people consider these important positions their unalienable right. So if the chairmen of the Transport Commission and Railway Executive want to know when to get the "men of commonsense and enterprise," they now know where to find them.

Yours faithfully,
E. R. B. ROBERTS

Eynesbury, St. Neots

Transport—A Liability for Ever?

April 30

SIR.—I notice Mr. F. Smith, in a letter under the above heading in your April 20 issue, suggests "the Executives should be merged into a kind of General Staff, organised like the Board of Admiralty, and charged with the planning and development of co-ordinated services." The meaning of this is anything but clear, and it may be wondered to what sort of position it would lead. The regional officers should certainly be delegated more power and authority within their respective regions without so much reference to the Railway Executive.

It is stated, "transport as a whole is far too expensive." Confining my remarks to railways—your correspondent is doubtless aware of the principal reasons. Are not all essential materials and equipment for operating purposes, for example coal, steel, timber, locomotives, rolling stock and the thousand-and-one items of all descriptions even more expensive, plus labour costs, and do not these far outweigh the percentage increases already applied to rates and fares?

If Mr. Smith claims to be able to make transport "much cheaper and more efficient and to pay its way at a lower level of total cost"—still referring to railways only—it is a problem yet unsolved by the British Transport Commission and the Railway Executive! Perhaps he could give an indication in clear and precise terms a few of the first steps he would take to bring it about; theory and generalisations are of little use.

Yours faithfully,
H. F. DALTON

263, Eastcote Road, Eastcote

Closing of Branch Lines

April 19

SIR.—I notice that the Railway Executive has been considering closing part of the original Stratford-on-Avon & Midland Junction Railway. The original intention was the closing and removal of the Helmdon-Wappenham section from Blisworth to Banbury, and the closing of the Moreton Pinkney section from Blisworth to Stratford-on-Avon. It has now been decided to keep the line from Blisworth to Banbury open for goods traffic, and suspend the passenger service. The action has been taken in view of the falling-off in traffic—in passenger traffic due to the high fares compared with other forms of transport—and poor service (two trains each way each weekday, and no trains on Sunday).

Closing this line for passenger traffic is retrograde, especially as from Blisworth to Banbury it runs within four miles of two internationally-famous places, Sulgrave Manor (connection with George Washington and of great interest to visitors from the U.S.A.), and Silverstone Aerodrome, used for international motor races and the main venue of the R.A.C. track events. Sulgrave Manor is approximately 2½ miles from Helmdon (L.M.R.) Station, and Silverstone 4 miles from Wappenham Station.

This line could serve race meetings at Silverstone Aerodrome by routing trains to Wappenham Station and then conveying passengers by buses to the track. The

trains from London could start from St. Pancras and proceed via Bedford Midland Road, Olney, and Towcester, to Wappenham; trains from the north of Bedford, on the Midland line, could be reversed at Bedford and proceed, as above. If improved junctions were made at Blisworth with the London Midland Region main line, and at Banbury with the Western Region main line from Paddington to Birmingham, trains from other parts of the country could be routed to Wappenham with the minimum of reversal.

It is appreciated that the London Midland Region has run excursion trains in connection with Silverstone motor race meetings, but they were run to Blisworth and passengers were then conveyed by buses from Blisworth to the course. This meant running buses along about eight miles of main roads, which are congested when important race meetings are being held at Silverstone, making transit from Blisworth Station to the course very slow. The use of Wappenham Station would enable rail passengers to reach the course much quicker by the use of normally little-used country roads, which in the event of a large motor race meeting at Silverstone could be reserved for buses conveying rail passengers.

Improved junctions at Blisworth and Banbury would assist traffic to and from this section; at Blisworth they would enable through trains to pass from the old L.N.W.R. main line to the S.M.J. section without reversal through sidings. At present, passengers from Northampton (the nearest large town) to stations on the line have to change platforms and trains at Blisworth; the suggested improvements would enable through trains to and from Northampton to be routed with one reversal.

Improved junctions at Banbury would enable through trains to pass from the Western Region to the S.M.J. line without having to be shunted through sidings, and would enable the L.M.R. trains to use Banbury General, instead of the present L.M.R. station, Banbury Merton Street; this would give better connections and facilities for passengers at Banbury, as the two stations are about 200 to 300 yd. apart.

Another suggested improvement to make better connections from the old S.M.J. line to the former L.N.W.R. main line, is to make a spur from the Towcester and Olney line about 500 yd. west of the bridge over the L.M.R. main line south of Roade Station, and the down main line of the L.M.R. at the south end of the down fast platform of Roade Station. This spur, in existence years ago but later taken up, could be used for traffic from the Towcester direction to the L.M.R. main line only and not used in the reverse direction, to avoid interfering with main line traffic more than necessary.

Two other points where junctions could be made between the S.M.J. and other lines are at Fenny Compton with the Western Region and at a point about two miles south of Woodford Halse on the Great Central main line. The junction at Fenny Compton would enable Western Region trains to Stratford-on-Avon, from Paddington, to avoid Leamington Spa and Hatton Junction, and thus reduce the mileage and track occupation.

The spur connecting the S.M.J. and the former Great Central line, just south of Woodford Halse Station, was in existence years ago, but was later taken up. This spur would enable trains from Marylebone to run to Stratford-on-Avon and thus reduce the traffic Paddington Station would have to handle, in addition to providing an extra route for traffic to Stratford-on-Avon.

This line could be used for through trains from stations on the northern part of the former Great Central and using the spur from Woodford Halse to Byfield Station on the original S.M.J. line.

As the S.M.J. line runs east-west and connects Regions, its use by through trains could improve cross-country travel, but its possibilities do not seem to be used to the best advantage. As most of it is single track, it should be ideal for working by the Western Region diesel cars, which would help to build up passenger traffic, with minimum running costs.

Yours truly,

A. S. WHITNEY

19, Osborne Road, Queens Park, Northampton

Publications Received

East Coast Route. By George Dow. London: The Locomotive Publishing Co. Ltd., 88, Horseferry Road, S.W.1. 8½ in. x 5½ in. 64 pp. Illustrated. Paper covers. Price 7s. 6d. net.—The East Coast Route may really be said to date from August 7, 1850, when the Great Northern was opened between London (Maiden Lane) and Peterborough enabling the traveller to reach York and beyond by way of Peterborough, Boston, Lincoln, Doncaster and Knottingley in preference to Hudson's "Midlands and Eastern" route from Euston via Rugby, Derby and Normanton. He could even reach Aberdeen by rail in that year, over the metals of ten different companies. In the years that followed the route was improved and shortened, first by the adoption of the "Towns" route through Grantham, cut-offs through Selby and Durham, and, most spectacularly, the great Forth and Tay bridges. Mr. Dow has a stirring history to relate and unfolds it ably, with a wealth of detail. He describes the stations—at least three of them, York, Newcastle and Edinburgh Waverley, are among the finest in the country—the splendid bridges, signalling, and other features. There is a concise sketch of locomotive and carriage development, in which the partners in the East Coast route, the

Great Northern, North Eastern, and North British were to the fore. The final chapter of this survey describes famous East Coast expresses. The illustrations are excellent; there are some pleasing novelties, such as the original Tay Bridge, Glasgow Queen Street Station, and old locomotives at Darlington which add a distinctive touch to the work.

Engineering Directory, 1950-1951. 83rd Edition. London: "Engineering" Limited, 35-36, Bedford Street, W.C.2. 7½ in. x 5½ in. 212 pp. Paper covers. Gratis.—This publication contains an alphabetical list of civil and mechanical engineering equipment, with the names and addresses of the manufacturers of the particular products, also alphabetically arranged, and also the full names, addresses, telegraphic addresses, codes and telephone numbers of some leading firms. The directory will be of considerable assistance to those engaged in and associated with the engineering industry.

Modern Malleable.—A booklet containing a brief history of the firm, together with descriptive matter relating to the production of malleable iron castings has been published by Hale & Hale (Tipton) Limited, Dudley Port, Staffs. The various processes are illustrated, while the subjects dealt with

include the metallurgy of malleable iron, machining properties, and the various uses to which the material can be put. Also included are the mechanical, and physical properties, with test reports of Blackheart malleable cast-iron and Permatite iron, and a glossary of technical terms.

Eyre Smelting Company Calendar.—The Festival of Britain is the occasion for a calendar produced by the Eyre Smelting Co. Ltd., of Tandem Works, Merton Abbey, London, S.W.19, in the form of a map of London, showing the position of objects and buildings of interest in relation to the Eyre Smelting Company's Tandem and Aluminium Works. These items are illustrated in marginal sketches and described briefly on the back of the calendar.

Country Walks: First Series. London Transport Executive, 55, Broadway, S.W.1. 6½ in. x 4½ in. 135 pp. Illustrated. Paper covers. Price 1s. 6d.—In collaboration with the Ramblers' Association (Southern Area), London Transport has produced the first of a new series of Home Counties ramble books. The first book, which features 46 walks and has 20 maps and 12 photographs of wild life, is on sale at bookstalls, London Transport enquiry offices, station booking offices, and some country bus garages.

THE SCRAP HEAP

Thanksgiving

In November, 1950, at the season of Thanksgiving, there appeared in newspapers throughout the Mississippi Valley a statement, over the signature of a President of one of the large American railroads, with the caption "Thanksgiving for the Right to Work," and in the letterpress were the following sentences: "There's one ingredient in the making of a railroad that you can't measure in miles of rail, might of motive power, or tons of freight. Call it spirit, if you like. It's the quality that binds railroad men and railroad tools into a complex but unified whole."—*Mr. C. E. R. Sherrington in the "British Transport Review."*

Little Stations

Most of us know of little railway stations which it seems scarcely worth while to keep open, and yet, in spite of all the pressure on British Railways to economise, they continue to receive their two or three leisurely trains a day. . . . Even the most out-of-the-way station which never seems to have any passengers may be of particular value to some section of the community. For every demand that the railways ought to save money by closing such-and-such a station the Railway Executive is at least equally likely to receive protests from local interests that the closure would bring hardship.

No branch railway line is in fact closed until local authorities, town planning authorities, any traders likely to be concerned, and the National Farmers' Union have all been consulted and representations which they may make, considered. . . . By the end of 1951 the Railway Executive hopes to have saved about £900,000 a year by closures brought about since nationalisation . . . with at least as much and probably more energy than was shown by the old railway companies which, in

25 years between 1923 and 1947, closed 350 stations to all traffic and 380 to passenger traffic.—*From "The Manchester Guardian."*

Dirty Train Windows

British Railways spend good dollars in advertising overseas the advantages of travelling by rail in Britain. But they neglect one simple essential for ensuring that a visitor to Britain shall see the countryside by train. It is literally impossible to see through the window of any of the trains on which I have travelled. In Canada and the United States the windows of trains are washed as part of the daily clean-up routine. Here, although floors and upholstery are swept, the dirt is allowed to remain on the windows. With the best will in the world I have not been able to "see Britain by rail." In Festival year, when so much is being done to attract visitors from overseas, would it not be possible to put a few dozen men with hoses and long-handled brushes into terminal stations to see that the trains are sent out with transparent windows?—*From a letter by Miss Doris McCarthy to "The Times" of May 7.*

My considerable experience as a traveller on British Railways does not enable me to support the views of Miss Doris McCarthy. . . . As I read your correspondent's letter in a well-appointed and comfortable express train this morning, it was so easy and enjoyable for my fellow passengers and myself to look through the large windows and enjoy the beauty of our belated English spring.

Let us complain, by all means, when there is reason to, but in so doing let us not add by exaggeration to the many real difficulties of those responsible for running our trains—on the whole so well.—*From a letter by Mr. A. Edward Davies, M.P., to "The Times" of May 10.*



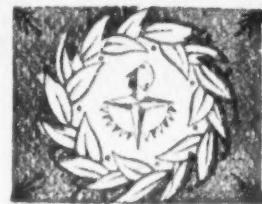
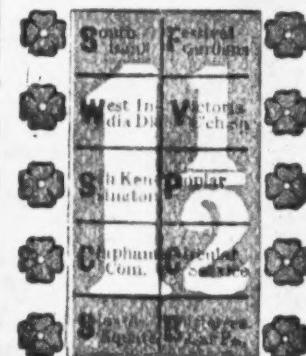
"Ah, well—the rising cost of transport"

[Reproduced by permission of the proprietors of "Punch"]

Souvenir Bus Tickets



LONDON TRANSPORT
SPECIAL BUS SERVICE
FESTIVAL OF BRITAIN



Passengers on London Transport Festival bus services receive souvenir tickets 4 in. long and 1 in. wide; they are in orange, mauve, blue, and green, according to fare value

Apple Pie Order

Apple pie as served on the British Railways is not as good as American apple pie, Mr. John Elliot, Chairman of the Railway Executive, said in New York, when replying at a Press conference to a question about the food served on dining cars.

Mr. Elliot said that he had come to the United States "to refresh my mind on the organisation of some big railways here."

Talylyn Railway Reopened

A crowd at Towyn Wharf cheered on May 14 when the tape was cut to mark the reopening of the Talylyn Railway, the oldest steam-hauled narrow-gauge passenger line in the world.

Introduced by Mr. Edward Thomas, a director of the newly-formed Talylyn Railway Preservation Society, who has been connected with the little line for 54 years, Mr. W. G. Trinder, of Banbury, on behalf of the society, said the line had been running practically continuously since 1865, and it was hoped to run a full service after June.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Rimutaka Tunnel

The Minister of Works has stated that six tenders were received for the construction of the Rimutaka Tunnel—three from the U.S.A., one from France, and two from New Zealand firms. The successful tender, that of Morrison-Knudsen Limited, of the U.S.A., was the lowest.

New Zealand labour will be used wherever possible. Excavation will be mostly by blasting. Mechanical loaders will fill waiting wagons with blasted rock at the rate of 10 tons every three or four minutes. A complicated system of ventilation will disperse fumes caused by the blasting.

It will be necessary to blast away more than 500,000 tons of rock to make the 5½-mile tunnel, but much of this rock will be used for mixing with concrete which will line the tunnel; the remainder will be used for embankments.

Asked when the tunnel was likely to be finished the Minister said that the Otira Tunnel on the West Coast of South Island was not completed for 15 years, although work on it was not continuous. Projects similar to the Rimutaka Tunnel would be completed in two years in the United States. Morrison-Knudsen Limited are stated to be the largest firm of tunnelling contractors in the world.

EAST AFRICA

Western Uganda Extension

The survey of the route for the extension of the Kenya-Uganda main line from Kampala to Kasese, in the foothills of the Ruwenzori Mountains, has been completed. (Kasese will be the railhead for the Kilembe Copper Mines). In addition, a route has been surveyed for a possible further extension to the shores of Lake Edward on the border between Uganda and the Belgian Congo. Work is expected to start in July on the construction of the first section of the new line from Kampala to Mityana.

Mr. P. H. Hicks, Resident Engineer on the Uganda extension, has recounted experiences of the survey parties. Difficulties with game are reminiscent of those encountered during the survey and construction of the original Uganda Railway fifty years ago. Although elephant and buffalo were the most numerous, lions and hippopotami were also encountered; Mr. Hicks himself counted more than 1,000 head of elephant during the survey. Parties were "treed" by buffalo several times, and 15 buffalo had to be shot. To save time, armed game scouts went along with advance parties, whose work was being continually disturbed by the game.

The surveyors and their assistants were working through country with no roads or tracks. Head loads had to be carried by porters and it was not easy

to recruit men able and willing to undertake this work. Water for the survey parties was obtained from water holes and swamps. Rations were carried for 250 miles to the most advanced of the parties.

The route lay through papyrus swamp, thick bush, elephant grass and forest. The transport difficulties were overcome by the construction of 35 miles of bush tracks and the reopening of old African roads.

CANADA

C.N.R. Deficit Forecast

Mr. Donald Gordon, President of the C.N.R., predicted that the railway would have a deficit of \$20,997,000 this year. His forecast was made in a report laid before the Parliamentary Committee on Railways & Shipping. Last year, the railway had a deficit of \$3,261,236 although it had expected to lose \$32,236,000.

Smalls Traffic

Small shipments of freight will be received by the Canadian railways only five days a week when their short-work week comes into effect on June 1. The restriction will apply to part load shipments, which now are handled six days a week. Larger consignments will not be affected.

The change results from the 40-hr. week obtained by railway employees as the result of last August's strike. The standard work week previously was 48 hours.

UNITED STATES

Boston & Albany Dieselisation

The Boston & Albany, an affiliate of the New York Central, is now completely diesel operated. The last run of a steam locomotive on the B. & A. occurred 117 years to the month after the railway's first steam locomotive, a wood-burner, left Boston on a seven-mile journey.

The single-track Putnam division of the N.Y.C. is to be dieselised within a few years. Ultimately, it is stated, the whole N.Y.C. system will be diesel-operated.

New N.Y.C. Harlem River Bridge

The New York Central has begun construction of a new four-track, vertical lift bridge over the Harlem River, New York. It will carry all Central and New Haven trains using Grand Central Station, and is being built immediately west of, and to replace, the present swing bridge between the Manhattan and the Bronx.

It is due to be completed in 1954. The first step, sinking five concrete piers into the river bed, will take about 18 months; the second phase will be construction of the remainder of the substructure, abutments and super-

structure, and removal of the existing bridge. The new bridge will open and close in four min., less than one half of the time required by the present bridge. It will provide a single 225-ft. channel for vessels, compared with the present two 100 ft. channels. The new bridge and approaches will be 2,227 ft. long. The centre, lifting span will be 340 ft. long, and will be electrically operated with the aid of steel-encased concrete counterweights.

ARGENTINA

Nationalisation of Corrientes Railway

The 48-mile 2-ft. gauge rural railway between Corrientes and Mburucuyá (Ferrocarril Correntino) has been transferred to national ownership.

Northern Transandine Railway

In accordance with the provisions of the recently-signed Argentine-Chilean agreement, sufficient passenger rolling stock must be prepared for direct operation between Antofagasta and Salta within 60 days. For goods traffic, the period stipulated is up to December 31.

Sarmiento Branch to be Lifted

The Municipality of Buenos Aires and the Sarmiento Railway have agreed to lift the little-used branch between Villa Luro and Ingeniero Brian goods station, and to replace it with a motor road to be named "Avenida del Justicialismo."

DENMARK

Esbjerg-Copenhagen Boat Train

The greater passenger complement of the new ships of the United Shipping Company on the Harwich-Esbjerg route has necessitated increase in the capacity of the Esbjerg-Copenhagen diesel-hauled boat train, the "Engländer," which will be composed of seven, instead of the present four cars.

In the new train, the first two cars are a train unit containing diesel engine, baggage compartment, and "common" class seats; the third is a standard first class coach; the fourth a restaurant car of the Wagon-Lits Company; the fifth and sixth vehicles are articulated, consisting of one first and one composite (first and "common" class) coach; and the seventh is a motor coach with diesel engine and "common" class seats. Total seating capacity is 102 first and 194 "common" class.

For the Little Belt train ferry crossing between Nyborg and Korsør, the first four cars are placed on the centre track of the ferry, and the articulated unit and motor coach on one of the outer tracks. When the set is not working the "Engländer," it can be divided into a four-car and a three-car set, and used for ordinary traffic. Running time between Copenhagen and Esbjerg is reduced to 5 hr. 20 min. in either direction.

Traction at the Industrial Frequency

Power supplies and motive power equipment for single-phase electrification at 50 cycles per second

ALTHOUGH of modest length the recent electrification of the French National Railways branch from Aix-les-Bains to Annecy has aroused widespread interest by the adoption of 50-cycle supply and traction equipment. Trials are being conducted at present with a locomotive having single-phase traction motors designed for operation at the 50-cycle frequency (see our January 26 issue). A second machine with 50-cycle motors is under construction, and in due course comparative tests will be possible between these two locomotives and a third prototype in which d.c. motors will be supplied through a rotary converter. The Oerlikon Company of Switzerland, maker of the electrical equipment for the first of the

connected to a different phase from its neighbours. A non-energised isolating section is necessary between adjacent live sections, and provision must be made for energising it in the event of a train stalling there. A suggested supply scheme is shown in Fig. 1. This arrangement is proposed for main-line electrifications of the order of 100 miles or more, and it is suggested that the most favourable conditions in respect of a balanced load would be obtained if the three-phase line were fed from each end.

An alternative method of supplying the contact line is by means of Scott-connected transformers as shown in Fig. 2. This arrangement is in use at present at Annecy on the S.N.C.F. ex-

but practical experience is quoted to support the view that when the traction load represents only a small proportion of the total carried by the supply system, no harmful effects are caused by the single-phase demands.

Motor Design Features

A brief restatement of the commutation problem of the single-phase series motor recalls the transformer effect of the pulsating flux in inducing voltages in the armature conductors. This gives rise to sparking as the coils are short-circuited by the brushes, which becomes more serious as the frequency of the supply is increased. It is possible to compensate for the transformer effect by means of shunts across the commutating poles, but it remains a problem at starting and has been the cause of low frequencies such as 16½ or 25 cycles being used for traction in preference to the industrial standard.

At 50 cycles the voltages due to transformer effect can be limited to similar values as developed at lower frequencies by a weaker field strength per pole, but the result is a lower armature back e.m.f. and a heavier armature current. For this reason it may be advantageous to connect pairs of motors permanently in series. It is stated that in practice the current in a 50-cycle motor is in the region of 4 amp. per h.p. compared with 2 amp. per h.p. at 16½ cycles. This heavy current, reaching 2,640 amp. in the Oerlikon motors of the S.N.C.F. locomotive at their 1-hr. rating of 623 h.p., has necessitated using a duplex lap armature winding with equalising connections, and a large number of parallel paths in the field system, where the section of copper and the current per conductor have been kept within the same limits as in 16½-cycle practice.

The number of brushes is no greater than is used in standard traction motors that were supplied to the Swiss Federal Railways in large numbers some 15 to 20 years ago, and which are still considered eminently satisfactory in service. By deliberately restricting the diameter of the commutator in the interests of low peripheral speed and reduced maintenance requirements, it became necessary to use exceptionally narrow brush-holders. It has been possible to arrange them round the circumference of the commutator without staggering, so that the commutator is of normal length, while special attention to ventilation keeps its temperature within accepted limits, although it is subjected to a current of about twice the value handled by a commutator of similar size in a 16½-cycle locomotive.

Some emphasis is placed on this feature of using a single commutator of normal dimensions, since there is a pre-

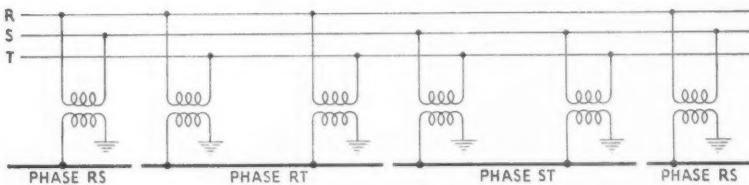


Fig. 1—Method of supplying single-phase contact line from three-phase grid

S.N.C.F. 50-cycle prototypes, has published recently what is probably the first detailed and comprehensive collective review of the different approaches that have been made to this system of traction,* and of the design problems associated with it. In view of the close attention with which the performance of the first locomotive is being watched by traction engineers in many parts of the world, certain fundamentals of 50-cycle technique as stated in this publication are summarised below.

With a 50-cycle system, it is proposed that the contact line should be supplied through transformer substations connected to an existing high-tension cable route of the industrial three-phase power network. This would eliminate the expense of a ring main or similar feeder system linking the substations and carrying a voltage intermediate between that of the grid and the contact line. A higher voltage than is commonly used for single-phase electrification is desirable because of the increased impedance at the 50-cycle frequency. On the Aix-les-Bains to Annecy branch 20,000 V. has been chosen, and consideration has been given to increasing this to 25,000 V.

In order to distribute the single-phase traction load between the three phases of the grid, it is necessary to divide the contact line into sections, each con-

nected to a different phase from its neighbours. A non-energised isolating section is necessary between adjacent live sections, and provision must be made for energising it in the event of a train stalling there. A suggested supply scheme is shown in Fig. 1. This arrangement is proposed for main-line electrifications of the order of 100 miles or more, and it is suggested that the most favourable conditions in respect of a balanced load would be obtained if the three-phase line were fed from each end.

An alternative method of supplying the contact line is by means of Scott-connected transformers as shown in Fig. 2. This arrangement is in use at present at Annecy on the S.N.C.F. ex-

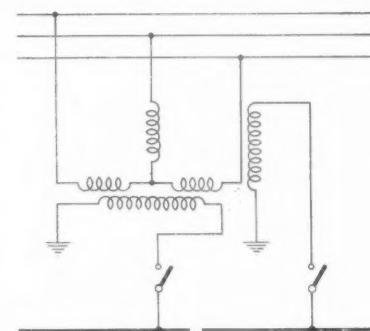


Fig. 2—Scott-connected transformers supplying adjacent sections of contact line at a substation located similarly to those shown in Fig. 1

Fig. 1 makes it possible to present a reasonably balanced load at each feeding point, provided that the flow of traffic is fairly regular. It is recognised that a perfect balance is unobtainable,

* "La Traction Électrique par Courant Monophasé à 50 pér./s." Zurich-Oerlikon: Ateliers de Construction Oerlikon

valent opinion that it is necessary to have two commutators per driving axle even when handling lower powers than are involved in the present instance. It is recalled that in the 50-cycle motors of one of the pre-war Höllenthal locomotives a low flux density per pole was achieved by using 28 poles divided between two motors permanently in series driving each axle, while the brushes were in a staggered arrangement that necessitated using commutators of twice the normal length. The latest A.E.G. locomotive for the Höllenthalbahn is also equipped with motors having two armatures permanently in series and two commutators each, although the number of poles is reduced.

Control System Characteristics

At 50 cycles the increased voltage drop due to inductive effects makes it possible to use fewer accelerating

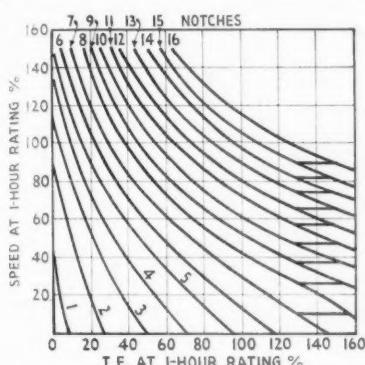


Fig. 3—Notching curves of S.N.C.F. 50-cycle locomotive

notches than are necessary in a 16 $\frac{2}{3}$ -cycle locomotive without risk of surges on passing from notch to notch. There are 16 notches in the S.N.C.F. 50-cycle prototype, with a maximum variation of 25 per cent. in tractive effort between notches (Fig. 3). A comparison is made with the Swiss Federal Railways "Re 4/4" locomotives, which have 24 notches and a maximum tractive effort increase of 40 per cent. A further effect of the inductive voltage drop at 50 cycles is to give the motor a non-saturated characteristic so that the tractive effort developed at speed is somewhat higher than in a 16 $\frac{2}{3}$ -cycle motor or a d.c. motor at full field (Fig. 4). The corresponding curve for a d.c. motor at 50 per cent. field approximates closely to that of the 16 $\frac{2}{3}$ -cycle motor. It is suggested that anti-slip devices might be desirable to safeguard the motors should wheelspin occur.

Control may be effected on the low-tension side of the transformer, as in the S.N.C.F. locomotive, or on the high-tension winding when very high powers and currents are involved. In these circumstances special precautions would be necessary because of the severe inductive effects at the high frequency.

The 50-cycle frequency has the ad-

vantage that induction motors running at 1,500 to 3,000 r.p.m. can be used for driving auxiliaries. Similar motors on 16 $\frac{2}{3}$ cycles would operate at 1,000 r.p.m., which usually is too low, so that series commutator motors have to be

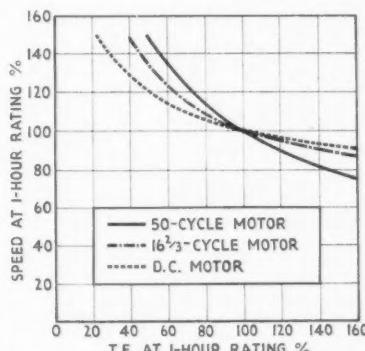


Fig. 4 Traction effort speed curves for three types of motor

employed for auxiliary drives. Where power requirements are small, the 50-cycle auxiliary motors could be of the capacitor-run type. For higher powers, to avoid using a number of the specially-constructed capacitors necessary for

traction service, one such motor could be operated as a phase-converter to provide a three-phase supply for the other auxiliaries. This arrangement is used in the S.N.C.F. 50-cycle locomotive and has the advantage that the other auxiliaries can be driven by squirrel-cage motors of light and robust construction, without commutators or brushes to maintain and having a high starting torque. The converter itself may be coupled to a d.c. generator for battery charging and also to an exciter for rheostatic braking if required.

It is acknowledged in conclusion that low-frequency motors are likely always to have advantages in respect of simplicity and reduced wear and tear of brushes and commutators. On the other hand, it is suggested that the 50-cycle motor has the merits of greater flexibility in operation and freedom from flashovers. Considerable importance is attached to the robust types of auxiliary motors that can be used, particularly when these are compared with d.c. machines for similar purposes. It is emphasised, however, that an assessment of the possibilities of 50-cycle traction in comparison with other forms must take into consideration the questions of electricity supply, fixed equipment, and motive power as a single whole.

New Electric Locomotives for Austria

*First post-war designs
for the Federal Railways*

TWO new series of locomotives are under construction for the growing electrified system of the Austrian Federal Railways. Both have the Bo-Bo wheel arrangement, and are designed for maximum interchangeability of electrical equipment, but they differ in mechanical details and the type of transmission. In one series of 16 locomotives (Class 1170.300), the first two of which are now in service, the Sécheron type of flexible drive is used, and the buffering and drawgear are mounted on the articulated bogies. The mechanical design is based on the "1170.200" Class, built between 1934 and 1937, but electric welding has been used extensively in their construction. This and other technical developments have contributed to a reduction in weight of about 4 per cent., combined with increases of 30 per cent. in power and 12.5 per cent. in maximum speed.

The one-hour rating of both the new classes is 3,200 h.p. at 39 m.p.h. Maximum tractive effort is 45,000 lb. and speed 56 m.p.h. The axleload is 20 tonnes. Both have 4 ft. 5 in. wheels.

A more radical departure from previous designs has been made in the second series of 15 locomotives (Class 1170.400). In these the buffering and drawgear are carried on the body, which is of welded construction and transmits the

tractive forces. A modified Kleinow spring drive is employed in the bogies, the number of elements being reduced to five because of the relatively small wheel diameter. In the interests of good riding qualities at speed there have been increases in the overall length, distance between bogie pivots, and bogie wheelbase. A spring-controlled linkage between the bogies reduces the guiding pressure on the wheel flanges.

Features common to both series are double-pan pantographs, extensive use of induction motors for auxiliary drives, and piston-type compressors.

SOUTH-EAST PARIS SUBURBAN SERVICES.—Since October, 1950, when the Paris-Laroche electrification was inaugurated, the eight all-metal passenger train sets in use on the suburban lines out of the Gare de Lyon, Paris, and formerly worked push-pull by tank locomotives, have been hauled by Bo-Bo electric locomotives. Both these, and wooden stock, will continue in service until replaced by multiple-unit sets now on order. With the inauguration of the summer timetable on May 20 Bourbons line trains out of Paris Lyon will be electrically hauled as far as Moret or Corbeil. One proposal was to run them electrically from Paris Lyon to Vierzon via Juvisy, but the reduction in speed necessary in traversing the complicated layout at Juvisy caused its rejection.

Electric Traction Section

Telephone Communication on Overhead Contact Lines

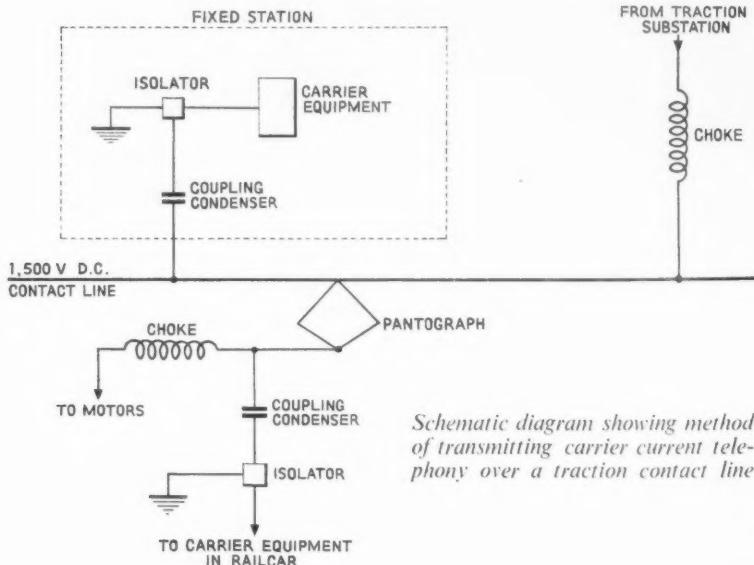
Carrier current system linking stations and railcars on two Swiss local railways

A TELEPHONE system using the overhead contact line as the link for exchanging messages between trains and stations has been installed by the Hasler Company of Berne on two routes of the Chemins de fer des Montagnes Neuchâteloises. The lines concerned (Les Ponts de Martel to La Chaux-de-Fonds, and Les Brenets to Le Locle) possessed an ordinary lineside telephone system in their steam-worked days, but this had deteriorated to an

extent which made renewal or replacement an essential part of the work of electrification. Accordingly the management decided to use the Hasler system, so that the newly-erected traction contact line serves as the telephone circuit, avoiding the necessity for separate poles and wires for communications.

that might follow a breakdown. Rapid replacement is facilitated by building the sets as self-contained plug-in units with knife contacts. In the railcars the back-plate has a shock-absorbing mounting. Fused and earthed isolators are provided to protect the high-frequency equipment from high voltages.

The two lines that have been equipped with this apparatus are respectively 10 and 2½ miles in length. A separate carrier frequency is used for trans-



extent which made renewal or replacement an essential part of the work of electrification. Accordingly the management decided to use the Hasler system, so that the newly-erected traction contact line serves as the telephone circuit, avoiding the necessity for separate poles and wires for communications.

Hasler System

This method of telephony uses high-frequency carrier currents, which pass to and from the overhead contact line (1,500 V. d.c. in these particular installations) through coupling condensers, associated with choke coils where necessary to block the carrier currents from certain parts of the traction circuits. Using different coupling circuits, carrier currents could be transmitted also over the contact lines of a.c. railways.

At stations, the high-frequency equipment takes its power supply from the normal mains, while the corresponding apparatus in the railcars is fed from a rotary-converter connected across the vehicle battery. All these H.F. sets, fixed or mobile, are interchangeable so as to minimise the interruption of service

mission and reception, so that conversations are carried on in the same way as on an ordinary telephone, no send-receive switching being necessary. Separate push-buttons are provided at every instrument for calling other fixed or mobile units, code ringing being used to select individual stations.

All instruments in the fixed or mobile group are normally on the same frequency, but as soon as a hand set is lifted to make a call this frequency is brought into use for transmission at the instrument concerned and the reply is heard on the adjacent frequency. Both push-buttons can be pressed together when it is necessary to make a collective call, which may be addressed to the fixed and mobile station groups individually or together.

In these circumstances, indicated by a distinctive call signal, receiving operators press a button on their instruments to cut out their transmitting carrier until they are invited to speak; otherwise simultaneous radiation from a number of unsynchronised instruments would produce a beat note and interfere with communication.



Carrier telephone equipment installed in railcar

Speeds on the lines equipped with this system at present do not exceed 37 m.p.h. At higher speeds some interference with telephony via the contact line might be expected, but the subject is under constant study and the system provides a basis from which it should be possible in course of time to develop a communication service between passengers in electric trains and the public telephone network.

BRUSH ELECTRICAL ENGINEERING CO. LTD.—The accounts of the Brush Electrical Engineering Co. Ltd., for the first time disclose the group net sales turnover which amounted in 1950 to £19,995,431 as against £15,570,803 in 1949. The net profit, before taxation and other adjustments, came to £1,646,070, against £1,307,485, while the purchased subsidiaries account for £313,228. Capital expenditure in 1950 was £1,168,478 of which £480,419 was provided out of depreciation provisions. The group needs further new capital.

BRITISH STANDARD FOR COLOUR IDENTIFICATION OF PIPE LINES.—Much attention has been paid to the use of colour for the identification of pipe lines, and difficulties have arisen because of differing opinions as to whether the identification should be on the basis of the characteristics of the pipe content, or the identification of the pipe content as such. During the past 20 years three British Standards have been published dealing with the identification of piping, and in order to remove certain anomalies a new standard has been prepared. Copies of this standard (B.S. 1710:1951) may be obtained from the British Standards Institution, 24, Victoria Street, London, S.W.1, price 2s. 6d.

New London Transport Battery Locomotive

G.E.C. equipment for seven machines similar to pre-war design



SEVEN new battery locomotives are being placed in service by the London Transport Executive for hauling trains equipped for maintenance, cable-laying, and construction work, and for emergency duties when the normal power supply is interrupted. They are additional to nine locomotives which were supplied to the London Passenger Transport Board before the war, six of which have G.E.C. electrical equipment.

The satisfactory performance of the earlier series has led to the main features of the design being retained in the seven new locomotives, all of which have electrical equipment designed and manufactured by the General Electric Co. Ltd. The batteries have been supplied by the D.P. Battery Co. Ltd., Bakewell, Derbyshire, as sub-contractors to the G.E.C.; and the mechanical parts have been built by R. Y. Pickering & Co. Ltd., Wishaw, Scotland.

Arduous Service

Both the pre-war and post-war locomotives are designed for a severe and unusual service. They are capable of operation from the normal conductor rails when the supply is available, or for running on the battery on sections where the power is off. The batteries are also arranged for charging from the conductor rails.

On track-laying operations, two locomotives in multiple-unit must handle a 200-ton construction train at 30 m.p.h. on the level when running on the 600-V. conductor rail system, or at 15 m.p.h. when supplied from the batteries. On reaching the section under construction they must be capable of inching the train forward on rough track up gradients as steep as 1 in 30. During cable-laying a single locomotive must handle a 100-ton train and be capable of being driven continuously at speeds as low as 3 m.p.h.

The characteristics required have been obtained by using three combinations of the four motors—all in series, two series pairs in parallel, and all in parallel—together with multi-notch resistance stepping and suitable resistance ratings. All three combinations are obtained on the one controller handle, which provides a total of 28 notches.



Interior of driver's cab

A hand-operated switch enables the driver to put the battery on charge from the live rail under fully automatic control, the rate varying according to the condition of the battery and charging being stopped when the battery is fully charged. Means are provided for giving the battery a gassing charge under skilled attention at the sheds, but this procedure is only necessary at considerable intervals.

The changeover from running rail to battery supply for the motors is under multiple-unit control from any driver's position. Interlocks are provided in all the circuits concerned to prevent any danger arising from irregular or faulty operation.

In the latest locomotives it has been possible to provide a battery of 1,008 amp.-hr. capacity, as compared with 768 amp.-hr. in the pre-war series, thus giving a higher factor of availability. The main motors are of a standard L.T.E. design as supplied by the G.E.C. for other duties on London Transport railways, but have been slightly modified by the L.T.E. to give them characteristics similar to those of the motors in the earlier locomotives. It is therefore possible to operate the pre-war and post-war locomotives in multiple if required. As modified, the motors are rated at 210 h.p. (1-hr.) and 150 h.p. (continuous).

The principal change in the constructional features of the new locomotives concerns the method of handling the batteries. Runners are permanently built into the body to carry a small lifting device, which can be positioned so as to reach any cell, raise it, and lower it through a trap-door in the floor. This procedure is found more convenient for maintenance purposes than the original system of lifting the cells out through removable portions of the roof by means of an external crane.

The locomotives and the equipment have been designed under the direction of Mr. W. S. Graff-Baker, Chief Mechanical Engineer (Railways), London Transport Executive.

SWEDISH LLOYD SAILINGS.—The British & Northern Shipping Agency Limited has recently issued the Swedish Lloyd sailing list for the summer season. The list deals with sailings between London and Gothenburg up to September 30, and gives useful information on tickets and fares, catering, passports, luggage, and other details, as well as the lists of sailing dates.

ENLARGED B.I.S.R.A. LABORATORIES IN LONDON.—The British Iron & Steel Research Association announces that it has acquired the whole of the light industrial premises at 140, Battersea Park Road, London, of which the physics, chemistry, and plant engineering laboratories now occupy about one quarter of the space. This will make available some 43,000 sq. ft. of additional laboratory and office accommodation, until recently occupied by the research department of Powell, Duffryn Research Laboratories Limited. The Plant Engineering Division and Chemistry Department, including the Corrosion & Refractories Sections, will move into the new accommodation as soon as necessary alterations have been sufficiently completed, and the move will probably be completed in the autumn. This in turn will make possible an expansion of the physics laboratories.

Waterloo and the South Bank Exhibition

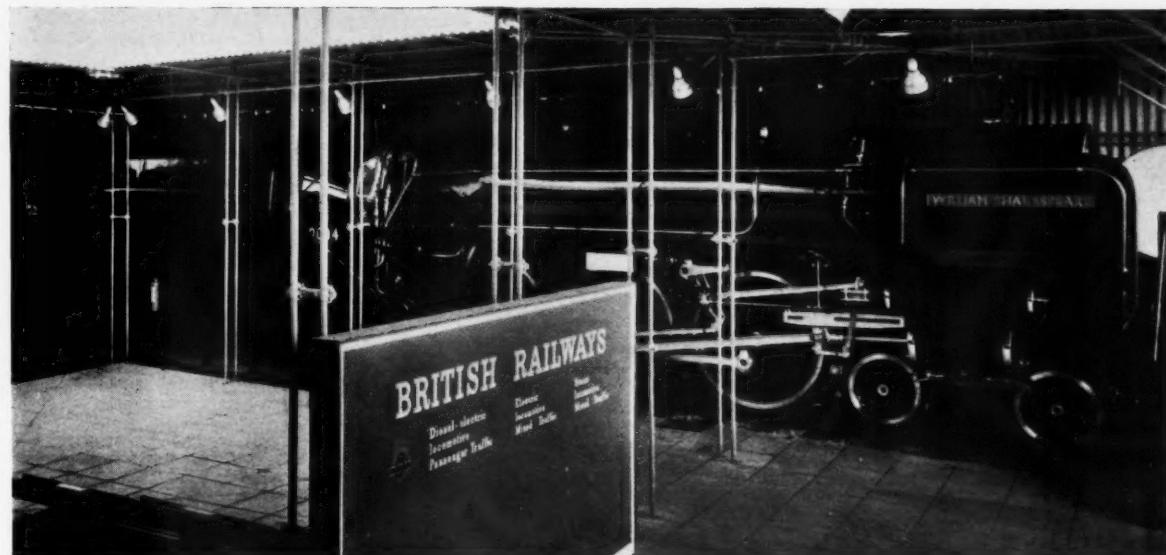
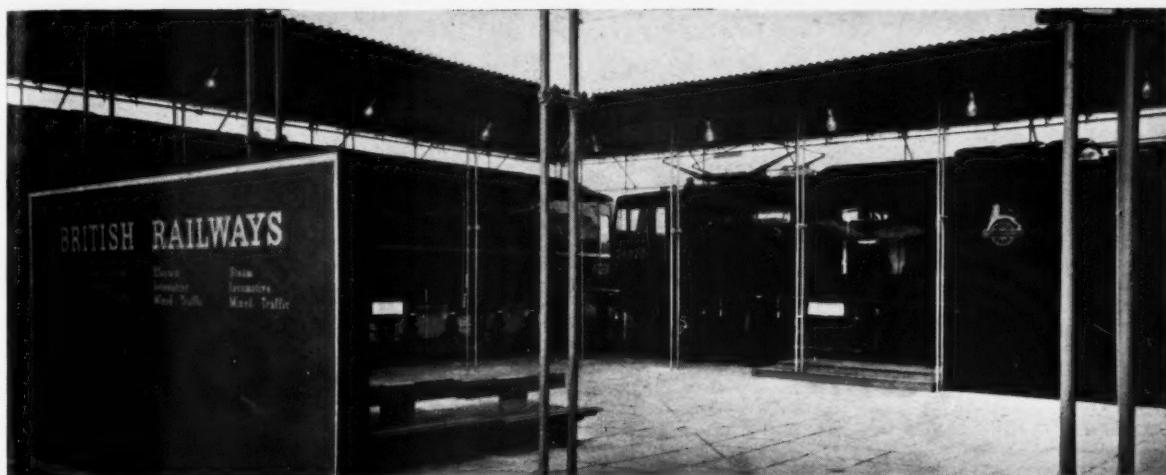
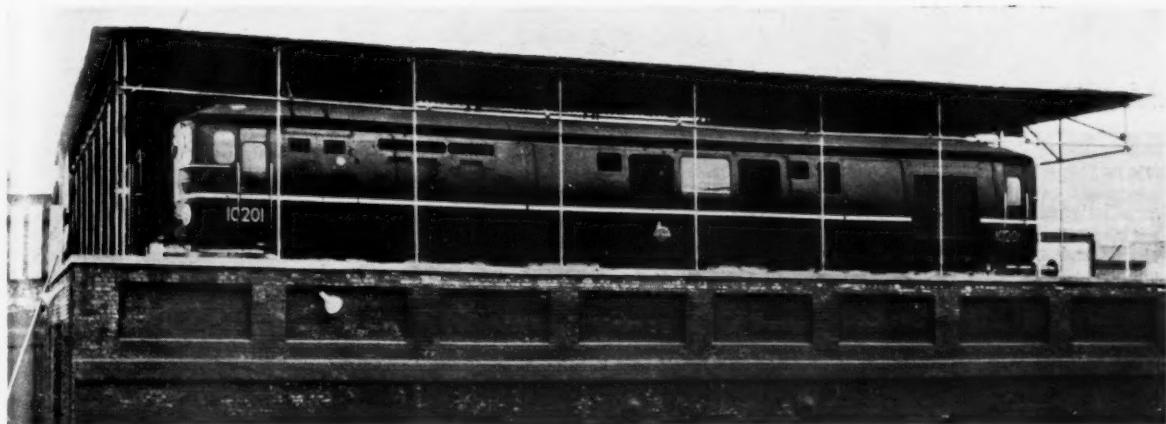


Part of the exhibition site seen from Waterloo Station roof



Entrance to Waterloo station from York Road. Fluorescent lighting is installed on approach road, using G.E.C. lanterns, each with three 5-ft. 80-W. lamps

British Railways Festival Exhibits



British Railways exhibits at the South Bank: (top) Southern Region 1,600-h.p. express passenger diesel-electric locomotive; (centre) electric locomotive for Manchester-Sheffield electrification; (bottom) "Britannia" class 4-6-2 locomotive, "William Shakespeare"

Shunting Locomotives for Steelworks

Three 0-6-0 saddle tank engines embodying special features

AMONG the orders recently completed by W. G. Bagnall Limited, Stafford, are three 0-6-0 type saddle tank shunting locomotives for delivery to the Margam works of the Steel Company of Wales Limited. They were designed and built to the requirements of the firm and embody details and features of construction which have become standard on Bagnall locomotives supplied to the firm over

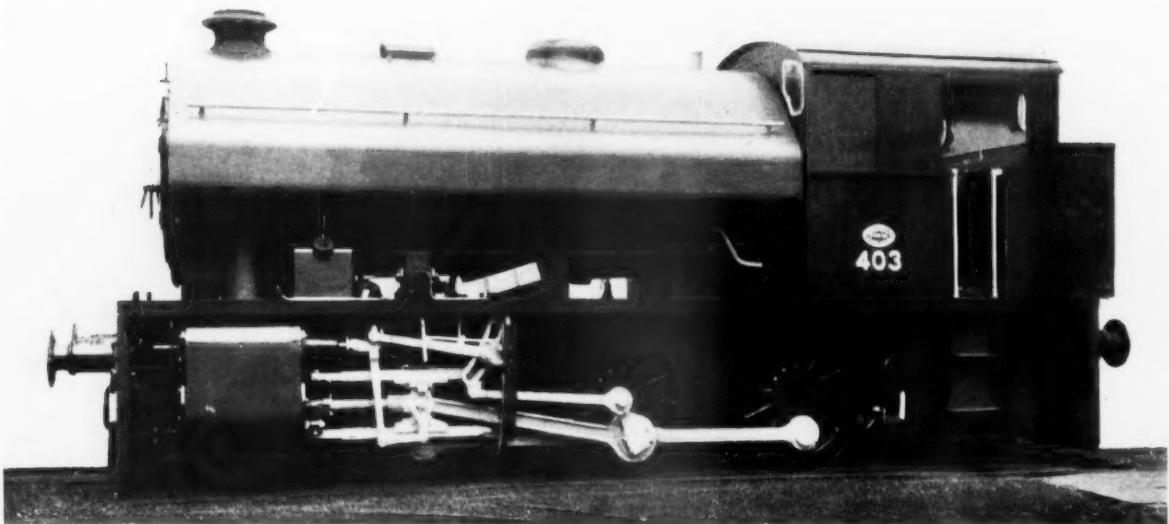
a number of years. Features have been incorporated to facilitate maintenance and servicing. The locomotives are required to haul seven ladle cars of 65 tons gross weight each up an incline of 1 in 100, and to traverse curves of 170 ft. radius.

The frames are of robust construction, the main frames being $1\frac{1}{2}$ in. thick, and the buffer beams 3 in. thick. The buffer beams extend to within 5 in. of rail level,

and act as rail guards, derailing bars, and also protect the locomotive from damage which may be caused by material lying too near the track. Heavy type buffers are fitted and the drawbar has a shank $2\frac{1}{2}$ in. dia.

Special features incorporated include single, double-row self-aligning, roller bearing, cast-steel axleboxes supplied by the Skefko Ball Bearing Co. Ltd., fitted

(Continued on page 562)



Bagnall 0-6-0 saddle tank shunting locomotive

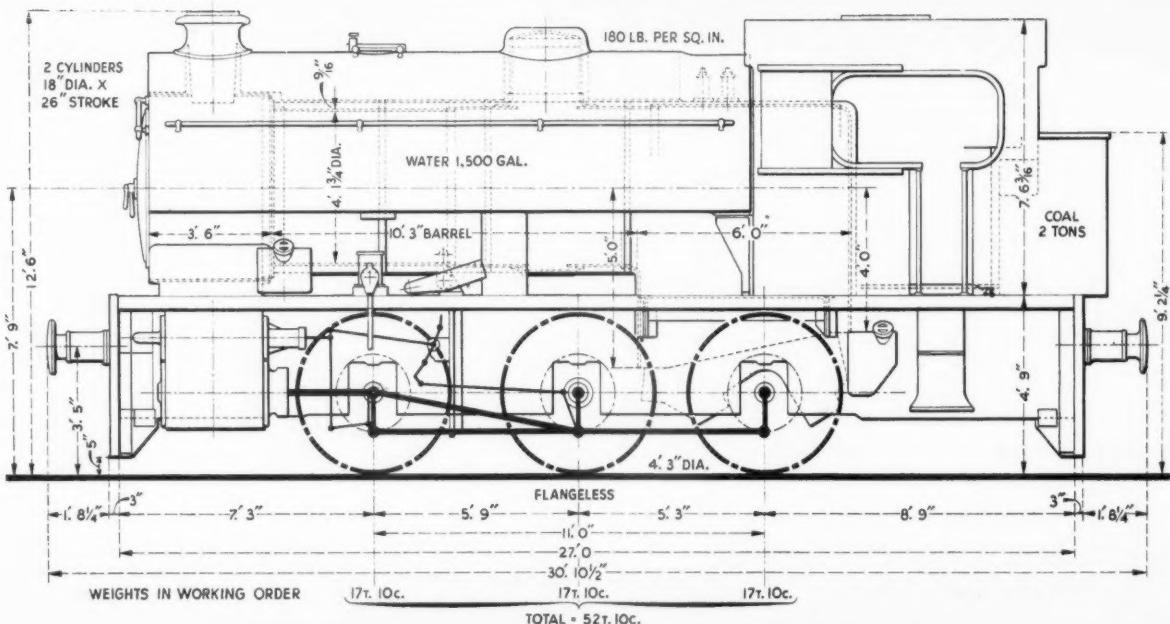


Diagram of the principal weights and dimensions of the locomotive

Rubber-Tyre Coaches in Switzerland

Important weight reduction, compared with standard lightweight stock, in experimental vehicles with Michelin-type wheels

INTEREST in the possibilities of rubber-tire railway vehicles for service in Switzerland dates from 1938, when delegates from the Swiss Federal Railways attended trials of a Michelin electric railcar in France. Joint development work put in hand by Schweizerische Wagons-und Aufzugsfabrik, Schlieren-Zurich, and the French Michelin company (Robert Puisaux et Cie.), but was interrupted by the war, and not resumed until 1946.

A year later the plans for such stock were approved by the General Management of the Swiss Federal Railways, who ordered one third class coach of normal steel construction and one second class coach built of light alloys.

vehicle. These comparisons are tabulated in more detail below:—

	Tare weight Tons cwt.
Standard lightweight coach (second class) ...	29 0
Second class rubber-tire coach ...	12 10
Standard lightweight coach (third class) ...	28 1
Third class rubber-tire coach ...	14 3

The seating capacities of the new second and third class vehicles are 46 and 76 respectively.

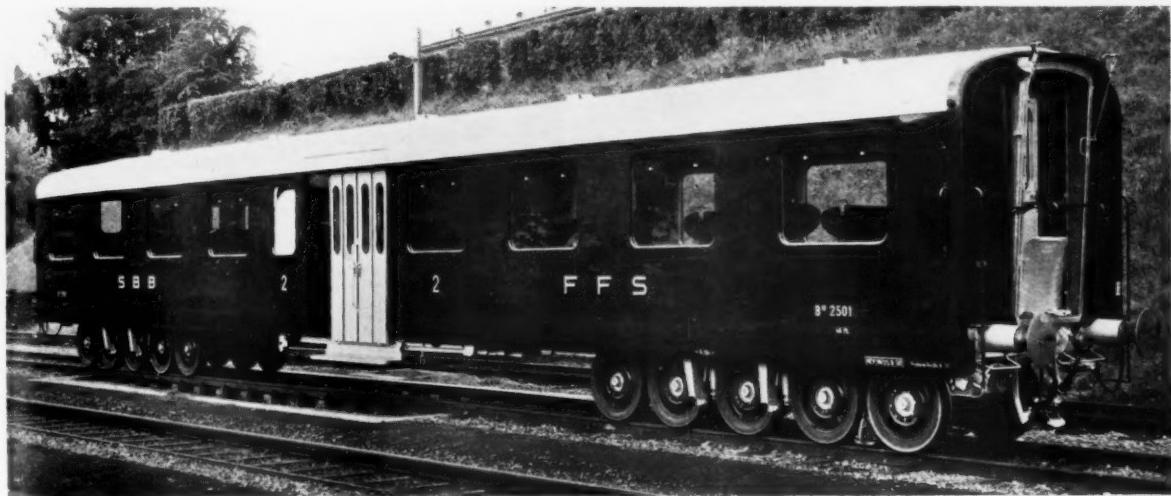
Lightweight Body Construction

In both vehicles the body framework is of self-supporting girder construction. The steel body frame of the third class coach is made of very thin sheet steel sections and angles, mostly spot-welded

sheet and by the body uprights. All joints are spot-welded. The roof is formed of two longitudinal tubular members, curved crosspieces, and sheet .04 in. thick with stiffeners. Some of the joints in this structure are riveted and others welded.

For convenience of manufacture, the headstocks, the cross-members carrying the bogie pivots, and the frameworks for the side entrance doors are of welded steel construction. To the total body weight of 3 tons 4 cwt., light alloys contribute just over 2 tons 4 cwt. and steel nearly 1 ton. The weight reduction compared with a standard lightweight coach body is 69 per cent.

Both types of body were subjected to



Light-alloy coach of the Swiss Federal Railways, running on rubber-tire wheels

The bodies have been built by the Société Industrielle Suisse, and the two pairs of five-axle bogies by the Etablissements Carel, Fouché et Cie.

Both vehicles have been in trial service since December, 1950, on light expresses running between Berne and Lucerne, with occasional changes of duty for excursions or other special purposes. Their construction was described in the January, 1951, issue of the *Bulletin des C.F.F.*, from which the following details are taken.

Internal Similarity

The two coaches are similar in internal arrangement, having a central entrance vestibule between the smoking and non-smoking sections. In comparison with the standard all-steel lightweight stock, the overall length has been reduced by 4 ft. 7 in. and the height by 4 in. The reduction in weight is noteworthy, amounting to 50 per cent. in the third class and 57 per cent. in the second class

together. The underframe consists of longitudinals and crossbars on top of which is welded corrugated sheet steel, approximately .03 in. thick. Steel sheet of similar thickness is used for the side walls, and the same material, .02 in. thick, for the roof, stiffeners being attached to the inside surfaces of both. The completed body weighs 4 tons 18 cwt., representing a reduction of 52 per cent. compared with the standard lightweight coach.

The floor of the second class light alloy coach is built in a novel manner that affords maximum resistance to compression with the minimum amount of material. It consists of aluminium sheet .04 in. thick, bent to form box-shape longitudinal members which interlock with each other. There are 30 such members, each 65 ft. 7 in. long, and the whole floor weighs 11½ cwt.

The side walls are of sheet approximately .05 in. thick, strengthened on the inside by members of .06 in. corrugated

vertical loading and compression tests during construction. The vertical force applied was 24 tons 12 cwt., while the longitudinal compressions were 69 tons and 79 tons 16 cwt. These were withstood in a satisfactory manner considering the light construction of the body-work.

Bogies and Wheels

The type of five-axle bogie used in both vehicles has a frame built up of two tubular side members and six cross-members of similar shape, all of sheet steel and assembled by arc welding. The five axles do not rotate, and are attached to the frame by two resilient linkages which restrain longitudinal movement but allow a certain amount of lateral play.

This form of suspension is sufficiently rigid to relieve a burst tyre of its load completely, the weight being shared between adjacent wheels, which can carry it for some time without reducing speed.

Consequently it is not necessary to change a wheel at once in the event of a burst.

The hub of each Michelin-type wheel rotates on its axle on two roller bearings, and the wheel and brake drum are attached to the hub. The tyre is secured to the rim as in road motor lorry practice. It consists of an outer cover with a metallic supporting frame, and an inner tube of circular section which is inflated to a pressure of between 114 and 128 lb. per sq. in. A tyre of this type has a maximum continuous load-carrying capacity of 1 ton 3½ cwt. at 77 m.p.h. All wheels except those on the middle axle of each bogie are flanged in accordance with normal railway practice.

Each tyre incorporates a pressure gauge showing its degree of inflation, and an electrical contactor which closes to complete the circuit to a warning lamp if the pressure falls below 92 lb. per sq. in.

The body of the third class coach is supported on each bogie through four coil springs and a linkage system resting on the bogie bearing surfaces. In the second class coach four bearers on the body rest on articulated links attached to torsion bars in the bogie side frame members. Adjustment of the suspension systems proved very critical because of the light weight of the bodies. Hydraulic damping was necessary to control and suppress movements of the bodies relative to the bogies, and numerous trial runs were made to test its effects.

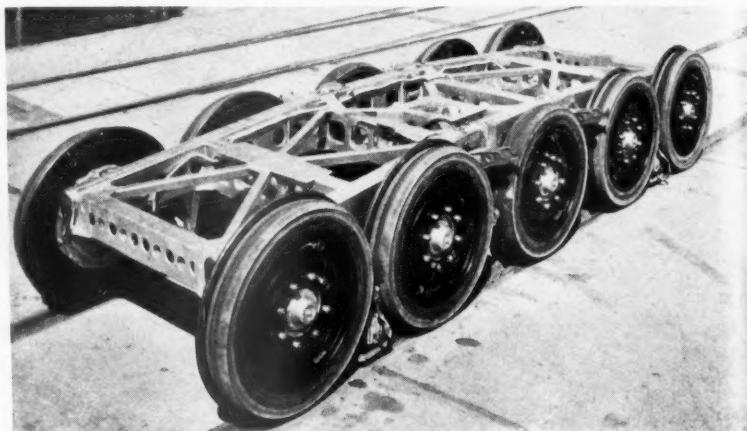
Two brushes on the bogies bear on the track and provide an electrical connection between the rails, mainly for the

purpose of track-circuited sections. They also serve as a return path for the train heating current and earth the coach body.

The drum type brakes on each wheel are operated hydraulically, but are controlled by the normal air braking system through a special device that converts

seat weighs 140 lb., being made of aluminium tube and sheet with rubber-upholstered back, headrests, and armrests. Luggage racks with an aluminium tubular framework are mounted on the side walls of both vehicles.

A lighting dynamo on each coach is driven by bevel gearing and a cardan



Five-axle bogie with rubber-tyre wheels

any given air pressure into a corresponding pressure of oil.

The interior panelling of the third class coach is covered with an artificial leather material, and that of the second class vehicle with Textolite plastic. Each complete third class seat for four passengers, built on a steel and aluminium tubular framework, weighs 64 lb. The corresponding second class

shaft from the inner axle of one bogie. Two roof ventilators are fitted, with cable control.

There are also two loudspeakers installed in each compartment. Provision has been made for installing an amplifier and gramophone turntable on the end platform, or the loudspeakers could be connected to similar apparatus in another vehicle of the train.

Shunting Locomotives for Steelworks

(Concluded from page 560)

with manganese-steel liners; liners of similar material are also fitted to the axlebox guides. The springs are underhung, and the axleboxes have only one guide lip, which is on the inside. No arrangements have been made for the lubrication of the manganese surfaces since this was not considered necessary.

The coupling rods, connecting rods, and eccentric rod big ends are fitted with self-aligning roller bearings, also manufactured by the Skefko Ball Bearing Co. Ltd. The locomotives are provided with outside cylinders and Walschaerts valve gear which operate 8 in. dia. piston valves.

The piston valve heads are each fitted with four normal piston rings. The weight of part of the valve rods, lifting links, and die blocks, is balanced by counter weights integrally forged on to the reversing shaft arms. This feature reduces the force required on the reversing lever. The slidebars are heat treated and hardened by the Shorter process on the surface in contact with the crossheads; the piston rods are fitted with metallic packing.

The boiler has a steel firebox, and an

Owens patent balanced regulator is fitted in the dome. Cast-iron rocking and drop-gates are fitted, operated from the cab; the locomotive is designed to burn patent fuel in block form. A self-discharging hopper ashpan is fitted with two hopper doors, also operated from the cab. The boiler is lagged with asbestos mattresses cased in steel sheets. Klinger reflex water gauges are provided, and an Everlasting blow-off cock, which can be operated by a hand lever from the footplate, is fitted to the front of the firebox.

The smokebox, which is self-cleaning, is of the circular type, and is supported on a fabricated steel saddle. The front plate is fitted with an asbestos joint ring for the door, which ensures tightness.

The saddle tank is rigidly fixed to the main frames and smokebox and is of all-welded construction throughout. The cab is also welded and is provided with side shutters and roof ventilator. All windows in the cab are made to open, and are fitted with armour plate glass, the rear ones being guarded by steel bars.

Four steel fabricated sandboxes are provided and are fitted with Lambert wet sanding apparatus.

Steam brakes are provided which act

on all wheels through double brake blocks. The steam brake valve can be operated from both sides of the cab, and the exhaust is arranged to discharge into the smokebox. A Davies & Metcalfe steam brake cylinder lubricator is fitted to the steam supply to the cylinder, and a Wakefield mechanical lubricator is provided with the feeds to the slidebars (through reversing cock), steam pipes, cylinder barrels, and valve rod guides. A 3-tone whistle is provided.

The locomotives were finish painted Midland red, and numbered 401 to 403. They are known as the "400" class locomotives of the Steel Company of Wales Limited.

The principal dimensions and other particulars of the locomotives are as follow:

Cylinders	...	18 in. dia. x 26 in. stroke
Wheels	...	4 ft. 3 in. dia. on tread
Wheelbase	...	11 ft.
Boiler pressure	...	180 lb. per sq. in.
Heating surface :		
Firebox	...	100 sq. ft.
Tubes	...	855 sq. ft.
Total	...	955 sq. ft.
Grate area	...	18-7 sq. ft.
Tractive effort	...	at 85 per cent. boiler pressure 25,272 lb.
Water capacity	...	1,500 gal.
Fuel	...	2 tons
Weight in working order	...	52-5 tons
Weight empty	...	40-5 tons

RAILWAY NEWS SECTION

PERSONAL

Mr. F. V. Stone has been appointed Manager of the Canadian Pacific Railway Department of Research, as from May 1.

Mr. J. E. Maggi, who, as recorded in our March 9 issue, has been appointed Argentine Minister of Transport, had recently been Sub-Secretary to the Ministry of Power & Mines. He is a civil engineer

British Railways, Scottish Region, announce that Mr. W. Dunsmuir, District Motive Power Superintendent, Glasgow (North), has been appointed to the position of Assistant Motive Power Superintendent, Scottish Region.

SWISS FEDERAL RAILWAYS

Mr. Paul Gysler, a Member of the Swiss Federal Railways' Board of Administration, has been appointed President of the Board,

Mr. J. A. Clarke, M.Inst.T., Chief Executive Officer of the Ulster Transport Authority, who, as recorded in our May 4 issue, has been appointed General Manager, is a native of Londonderry, and commenced his business career when he joined the Londonderry & Lough Swilly Railway in 1917. Three years later he entered the service of the Northern Counties Committee, with which he remained until 1935, serving in its Accountancy and



Mr. J. E. Maggi
Appointed Minister of Transport,
Argentina



Mr. J. A. Clarke
Appointed General Manager,
Ulster Transport Authority

and among the various public offices he has occupied are those of Minister of Economy, Public Works & Irrigation, Mendoza Province, and Director General of the State Central Electricity undertaking. Mr. Maggi has been First Vice-President of the National Power Directorate, and was President of the Argentine delegation of the Argentine-Uruguayan Technical Commission of Salto Grande. Following his appointment as Sub-Secretary to the Ministry of Industry, Mr. Maggi became Sub-Secretary to the Ministry of Power & Mines.

The Railway Executive announces that the following appointments have been made:

Mr. S. G. Hearn, Assistant Operating Superintendent, Western Region, to be Operating Superintendent, London Midland Region.

Mr. J. McCreadie, Assistant Operating Superintendent, Scottish Region, to be Operating Superintendent, Scottish Region.

in succession to Mr. Emert Béguin, who has retired. Mr. Escher has resigned from the Board on his appointment as a Federal Councillor and Mr. Lombard has retired from the Board. To fill the three vacancies on the Board the following new members have been nominated: Messrs. Victor Gauthier, a Director of the Swiss National Bank; Joseph Piller, a Deputy of the Council of States; Henri Perret, a National Councillor.

SOUTHERN REGION APPOINTMENTS

British Railways, Southern Region, has announced the following appointments:

Mr. W. Crawford, Chief Trains Clerk, to be Assistant to Operating Superintendent, Waterloo.

Mr. W. H. Scutt, Assistant District Traffic Superintendent, Woking, to be District Traffic Superintendent, Southampton.

Mr. C. E. Collins, Assistant Works Superintendent, Wolverton, London Midland Region, to be Works Manager, Lancing, in place of Mr. F. B. Illston.

Commercial Departments. He transferred to the Northern Ireland Road Transport Board on its formation, and was appointed Accountant, and, within a short time, also Secretary. In 1941 he was promoted to the position of Chief Executive (Finance) and to the membership of a committee of four chief officers then set up to manage the undertaking, which position, together with that of Secretary, he continued to occupy until appointed to the post of Chief Comptroller of the Authority in 1941. As such, he was responsible for all financial, legal and secretarial matters, and for the purchasing and custody of stores, for hotels, refreshment rooms and restaurant cars, and for general personnel matters. Later, he was appointed Chief Executive Officer. He is Chairman, Northern Ireland Section, Institute of Transport.

Lord Latham, Chairman of the London Transport Executive, has been elected President of the Association of Certified & Corporate Accountants.



Mr. O. M. Watson
Chief Traffic Manager, Western Australian Government Railways,
1948-51



Mr. John Ridley
Appointed Chief Traffic Manager, Western Australian Government Railways



Mr. V. R. Riley
Appointed Deputy Financial Adviser & Chief Accounts Officer, Oudh Tirhoot Railway, last year, now on leave in United Kingdom

Mr. O. M. Watson, who, as recorded in our April 27 issue, has retired as Chief Traffic Manager, Western Australian Government Railways, joined the railway service in 1900 as a messenger in the Perth telegraph operating room. He later entered the Chief Traffic Manager's Office as a cadet, and after ten years in Perth, was transferred to the District Traffic Superintendent's Office, Bunbury, in 1912. Almost immediately after the declaration of war in 1914 he was transferred to Transport, Perth, where he served throughout the war. He was appointed Transit Clerk in 1922, and Clerk-in-Charge, District Superintendent's Office, Bunbury, in 1929. Shortly afterwards he returned to Perth, as Transit Officer, and he also served for a period on timetable work before being appointed Stationmaster, Bunbury, in January, 1939. Mr. Watson subsequently held a series of appointments as District Traffic Superintendent for various districts until becoming Assistant Chief Traffic Manager & District Traffic Superintendent, Perth, in December, 1947. He was appointed Chief Traffic Manager in 1948.

to Mr. Frank Simpson, who has returned to the Office of the Vice-President in Montreal as Chief of Car Service for the system.

Mr. John Ridley, Assistant Chief Traffic Manager, Western Australian Government Railways, who, as recorded in our April 27 issue, has been appointed Chief Traffic Manager, is 62. He joined the Western Australian Government Railway service as a temporary clerk in 1911, shortly after his arrival from England, where he had had eight years clerical experience with the North British Railway. In Western Australia he progressed through various important posts in the Traffic Branch, and was appointed District Traffic Superintendent at Northam in 1940. He became Assistant Chief Traffic Manager & District Traffic Superintendent, Metropolitan District, in August, 1949, and when it was decided to divide this dual position into separate posts, Mr. Ridley was appointed Assistant Chief Traffic Manager in September of that year.

Mr. C. E. M. Hardie has been appointed a Director of Vokes Limited.

Mr. H. A. Cruse, a Director & General Works Manager of the Westinghouse Brake & Signal Co. Ltd., has been elected Mayor of the borough of Chippenham, Wiltshire.

EAST AFRICAN RAILWAYS & HARBOURS
The following appointments have recently been made by the East African Railways & Harbours:

Mr. Allan Johnston, Acting Assistant Chief Engineer, to be Engineer, Way & Works.

Mr. P. M. Anderson, Deputy Resident Engineer on the Northern Rhodesia & Tanganyika survey, to be Senior District Engineer.

Mr. A. G. Cowley, Assistant Locomotive Superintendent, to be District Mechanical Engineer.

Mr. J. R. P. McCrindle, Assistant Locomotive Superintendent to be District Mechanical Engineer.

Mr. W. Buttery, Assistant Traffic Superintendent, to be District Traffic Superintendent.

LONDON MIDLAND REGION APPOINTMENTS

The following staff changes have been announced by the London Midland Region:

Mr. A. L. Owen, District Engineer, Bradford, North Eastern Region, to be District Engineer, Manchester, London Midland Region.

Mr. A. H. Nicholson, Assistant (Wages Staff), Staff & Establishment Department, Paddington, Western Region, to be Assistant (Wages Staff), Office of Regional Staff Officer, Euston.

Mr. F. H. Henstock, Assistant to District Operating Superintendent, Derby, to be Assistant Divisional Controller (Freight Services), Divisional Operating Superintendent's Office, Derby.

Mr. S. B. Taylor, Deputy Secretary, British Transport Commission, has been elected to the Council of the Chartered Institute of Secretaries.

Mr. H. C. Grayston has been appointed Manager of the Newfoundland District, Canadian National Railways, in succession

Mr. V. R. Riley, who was appointed as Deputy Financial Adviser & Chief Accounts Officer of the Oudh Tirhoot Railway last year, and, as recorded in our May 11 issue, is at present on leave in the United Kingdom, served in the Accounts Department of the L.M.S.R. from 1932 to 1938, when he joined the South Indian Railway as an Assistant Auditor. In 1940 he enlisted in India in the Wiltshire Regiment and after obtaining his commission served with the Indian Infantry and rose to the rank of Major, before being recalled to the South Indian Railway in 1944. In the same year Mr. Riley was promoted to be Senior Accounts Officer in charge of Traffic Accounts, and in 1946 became Senior Accounts Officer, Workshops, including Workshop Stores Accounts at Golden Rock, in which capacity he also acted as non-technical assistant to the Chief Mechanical Engineer. He acted as Deputy Financial Adviser & Chief Accounts Officer, South Indian Railway, from December, 1948, to July, 1949, when he was appointed as Deputy Chief Accounts Officer of the Great Indian Peninsula Railway at Bombay, and took up his present position with the Oudh Tirhoot Railway last year.

Mr. G. G. Glen Carlisle has been elected a Director of Madras Electric Tramways (1904) Limited.

Mr. T. F. Lister, Chairman & Managing Director of the Hackbridge & Hewitt Electric Co. Ltd., has been elected Chairman of the British Electrical & Allied Manufacturers' Association for the session 1951-52; Mr. I. R. Cox, Managing Director of Metropolitan-Vickers Electrical Co. Ltd., was re-elected Vice-Chairman for the same period.

We regret to record the death at the age of 65 of Mr. J. P. Reynolds, Chairman & Managing Director of the Scottish Machine Tool Corporation Ltd. He also was sole partner of Reynolds & Wilson, London Office of Denham's Engineering Co. Ltd.; John Pickles & Son (Engineers) Ltd.; Fredk. Town & Sons Ltd.; Halifax & Snow & Co. Ltd.; and London, Midlands and Export Office of the Scottish Machine Tool Corporation Ltd.

British Transport Commission Statistics (Period No. 3)*Summary of the principal statistics for the four-week period ending March 25***STAFF**

	B.T.C. Head Office	British Railways	London Transport	British Road Services (Road Haulage)	Road Passenger (Provincial & Scottish)	Hotels & Catering	Ships & Marine	Inland Waterways	Docks, Harbours, Wharves	Railway Clearing House	Commer- cial Adver- tisement	Legal	Films	Total
Number ...	245	597,819 - 1,946	98,962 - 469	76,277 + 103	59,515 - 47	17,586 + 142	6,255 + 137	4,889 - 15	19,778 - 27	664	205	284 - 6	33 + 1	882,512 - 1,095

LONDON TRANSPORT**BRITISH TRANSPORT COMMISSION TRAFFIC RECEIPTS**

	Four weeks (Period No. 3)		Aggregate for twelve weeks	
	1951	1950	1951	1950
	£000	£000	£000	£000
British Railways				
Passengers	7,400	6,716	18,932	18,869
Parcels, etc., by passenger train	2,464	2,196	7,112	6,382
Merchandise	7,242	6,595	21,225	19,103
Minerals	2,603	2,434	7,869	7,109
Coal & coke	6,804	5,707	20,012	16,809
Livestock	74	99	207	280
	26,587	23,747	75,357	68,552
British Railways				
C. & D. & other road services	738	693	2,218	2,036
Ships and Vessels				
	613	516	1,729	1,517
London Transport				
Railways	1,211	1,117	3,599	3,332
Buses & coaches	2,416	2,351	7,011	6,837
Trams & trolleybuses	740	823	2,209	2,425
	4,367	4,291	12,819	12,594
British Road Services				
Freight charges, etc.	5,935	4,514	16,728	13,084
Road Passenger Transport				
	2,853	2,517	8,087	7,314
Docks, Harbours & Wharves				
	932	883	2,704	2,554
Inland Waterways				
	135	116	368	344
Hotels & Catering				
	1,119	1,026	3,191	3,004

LONDON TRANSPORT

	Passenger journeys	Inc. or dec. per cent. over 1950	Car miles	Inc. or dec. per cent. over 1950
Railways	000 47,894	- 4·4	000 17,025	- 5·6
Buses & coaches	213,007	+ 0·2	24,754	+ 3·6
Trams & trolleybuses	74,007	- 18·3	7,097	- 17·1
Total	334,908	- 5·2	48,876	- 3·2

INLAND WATERWAYS*Tonnage of traffic and ton miles*

	Tonnage per cent.	Inc. or dec. per cent. over 1950	Ton miles	Inc. or dec. per cent. over 1950
Coal, coke, patent fuel & peat	000 431	+ 1·8	000 5,708	+ 4·3
Liquids in bulk	169	+ 17·5	3,758	+ 17·8
General merchandise	267	- 13·1	4,352	- 9·2
Total	967	- 0·9	13,818	- 0·9

BRITISH RAILWAYS**Rolling Stock Position**

	Operating stock	Number under repair	Available operating stock	Serviceable stock in 1950
Locomotives	19,566	3,165	15,716	15,813
Coaching vehicles	58,059	5,447	52,612	51,560
Freight wagons	1,108,286	71,689	1,036,597	1,021,012

BRITISH RAILWAYS*Passenger Journeys (Month of February, 1951)*

Full fares	Monthly returns	Excursions, cheap day, etc.	Other descriptions	Workmen	Season tickets	Total	Inc. or dec. per cent. over 1950
4,852,000	7,307,000	14,640,000	3,037,000	17,692,000	17,341,000	64,869,000	- 0·6

BRITISH RAILWAYS*Freight Tonnage Originating and Estimated Ton-Miles (Period No. 3)*

	Minerals	Merchandise	Coal & coke	Livestock	Total	Inc. or dec. per cent. over 1950
Tons originating Ton-miles ...	000 4,618 395,753	000 4,196 573,640*	000 13,474 865,053	000 45	000 22,333 1,834,446	- 2·2 + 1·0

** Includes livestock***BRITISH RAILWAYS (Period No. 3)**

	Total steam coaching train-miles	Total electric coaching train-miles	Total freight train-miles	Freight train- miles per train engine-hour	Net ton-miles per total engine-hour	Locomotive coal consumption	
						Total tons	Lb. per engine-mile
1951	12,695,000	3,497,000	11,079,000	8·0	598	1,047,000	64·9
1950	14,125,000	3,713,000	11,331,000	8·3	585	1,095,000	64·5

Ministry of Transport Accident Report

*Beattock Summit, Scottish Region,
British Railways: June 8, 1950*

Colonel R. J. Walker, Inspecting Officer of Railways, Ministry of Transport, inquired into the fire which occurred at 4.56 p.m. on June 8, 1950, near Beattock Summit in the 11 a.m. express, Birmingham to Glasgow Central, consisting of eleven coaches drawn by a Class "6P" 4-6-0 engine, and by which five passengers—one man, two women, and two small children—lost their lives. No person was injured.

Traffic on both lines was stopped at 5.7 p.m. and single line working over the up line instituted at 8.39 p.m.; normal working was resumed at 10.30 p.m. Considerable dislocation of main-line traffic resulted. Fire brigades, warned by telephone from a nearby farmhouse at 5.10 p.m., arrived between 5.30 and 5.55 p.m. and the fire was under control 15 min. later. It was not possible to discover whether anyone remained in the burning coaches until 6 p.m. It was a fine, dry, warm day with a 15 m.p.h. breeze blowing against the direction of the train.

The fire had begun under a seat in the sixth compartment of the second vehicle from the engine, a composite corridor coach, No. 4851, and enveloped it and the next coach, a corridor first class, No. 1073. Both were gutted and all personal property and luggage in them lost. There were three soda acid extinguishers available one in each guard's van and another in the restaurant car. Of the passengers who died, one had been seated in another compartment three min. earlier and the man was not even in the same coach then.

Course of Events

The train had left Birmingham at 11 a.m. and stopped at Wolverhampton and Crewe, reaching Carlisle, 15 min. late, at 3.56 p.m. It left there at 4.2 p.m., 12 min. late, and passed Beattock North signal box at 4.46, having regained two min. The signalman at Greskine box watched it pass at 4.53 and, at about the same time, the fireman looked back along the right-hand side and a passenger walked up coach 4851. Everything appeared perfectly normal. Three min. later the communication cord was pulled—no doubt by someone in the compartment where the bodies were found—and smoke was seen pouring out of the vehicle and the leading end of the next one.

The driver stopped the train in about 80 yd. and two passengers in the fourth compartment of coach 1073 had to make their way along the corridor already full of dense smoke and overpowering fumes. They were unable to see, and, groping their way to the rear, managed to open a window in time to save themselves from being overcome. By the time the train stopped the rear half of coach 4851 and the gangway at the leading end of coach 1073 were burning fiercely. The other passenger, who had walked up coach 4851 just before, emerged from the toilet and found much smoke and heat, but reached a door and was helped out by a ganger who endeavoured unsuccessfully to examine the compartments but was forced back. He thought that he saw a woman's body in the fourth compartment. The whole incident, including the change of position of the passengers, almost certainly happened in a minute or less; the only passenger to escape in the coach was the one in the lavatory compartment.

The train was promptly divided between the third and fourth coaches and the lead-

ing portion drawn forward. A further division was made between the first and second, leaving the burning vehicles isolated. As some anxiety was felt for the coaches left on a 1 in 74 gradient, sleepers and chocks were applied to the wheels.

The report goes in detail into the positions in which the bodies were found; the essential fact is that all were in quiet, restful attitudes and showed no signs of struggle or attempt to escape. Consultations with medical and other experts convinced Colonel Walker that the victims were killed almost at once, if not instantly, by a sudden blast of extremely hot gases. The report also gives a technical description of the construction of the vehicles involved and their condition after the fire, supplemented by diagrams. Several interesting and peculiar details regarding the course and extent of the burning process emerge from this part of the document.

Evidence and Conclusions

As in the inquiry into the fire in the train at Penmanshiel tunnel on June 23, 1949, also conducted by Colonel Walker, it was necessary to hear considerable evidence. He heard 19 persons, including passengers, members of the train crew, lineside staff and others, and observes that despite "the extraordinary suddenness and force" with which the fire burst out and which naturally caused consternation among the few who saw it, yielding evidence more in the form of impressions than clearly remembered facts, when he considered the evidence as a whole he felt satisfied that it gave, beyond reasonable doubt, a true account of what happened and was sufficiently full to make it unlikely that anything else could have done so.

Colonel Walker had to consider how five persons in a compartment could be killed so quickly that they made no effort to escape or protect themselves, and yet how was it possible for one of them to pull the communication cord? Also, why did a passenger move from her own into the fatal compartment and why were some belongings found near the end of the corridor? Where did the man come from who was not in the coach at all immediately before, and why was he found sitting in the corner seat where a little girl had been seen by one of the restaurant car attendants who passed along a short time previously? The most vital pieces of evidence bearing on these problems were first, that the victims had been killed instantly, and, second, that the sixth compartment had been closed after Carlisle while the others are known to have been open.

After considering the possibility of slow or rapid carbon monoxide poisoning, which certain circumstances of the case appeared to rule out, Colonel Walker concluded that a wave of extremely hot gases, probably containing a high concentration of carbon monoxide, suddenly enveloped the victims, rendering them unconscious instantly. An ordinary fire burning in the open, however rapidly and fiercely it spread, could not do so. Even if some highly inflammable liquid had been ignited in the fourth compartment, unless perhaps in large quantities, there would have been some sign of movement by the victims, but that would also have ruled out the presence of passengers from outside it. It

must be concluded that the fire originated outside it and that gases entered it in force as the result of some explosion.

Weighing all these considerations, Colonel Walker reconstructed the course of events as being substantially as follows. Some time before the train reached Carlisle a lighted match or cigarette end carelessly thrown down in the sixth compartment found its way under the heater beneath the facing seat into a collection of dust and paper in the angle of the floor and rear soft wood partition, starting a smouldering fire, which spread to the partition and probably to the hair interior of the seat and back cushions. It smouldered for 50 min. or longer, and little or no smoke would be seen by a passer-by. The fire was using up the oxygen and forming carbon monoxide and highly inflammable gases of distillation from burning materials. The temperature was rising quickly. No doubt it was escaping gas that was noticed by the car attendant and the woman in the compartment ahead, who felt heat under the seat there. As long as the gases were contained in the compartment they could not ignite, from insufficiency of oxygen, but the fire continued to smoulder, burning a small hole between the sixth and seventh compartments, whence gases and smoke escaped into it and down the corridor of the following coach. This escape was at first minute, but once mixed with a large quantity of air, the gases cooled and did not ignite, travelling along as smoke and fumes.

The man later found dead was probably sitting in a leading compartment of the third coach and went forward to investigate. Probably he saw smoke in the seventh compartment of the other coach and more in the sixth and, not realising the potential danger, went to warn anyone further forward. He told the woman in the fifth compartment that there was a fire; no doubt they went together into the corridor and saw the other woman with the two children in the sixth compartment. Probably the man entered, told her to collect her things, and himself pulled the communication cord, while the little girl came to the door. The first woman had by then thrown her belongings down the corridor. Although they realised that the situation was dangerous, Colonel Walker feels sure that they had no idea of its nature or imminence, and quietly helped the woman and her children. At this moment, the hole in the partition having increased, the gases ignited, raising the temperature to a high degree and breaking a window on the corridor side. The main volume of gas mixed with the air, ignition followed, and there was a slow explosion in the corridor, perhaps also in the compartments where doors were open. The heat was much more than enough to kill anyone within range of the blast and set the coach on fire. Much of the evidence was in complete conformity with this, and when the ganger entered the coach the original flash had taken place and the victims were dead. There was a second case of this process after the train stopped. The presence of a baffle above the corridor dividing door in coach 4851 contributed to the gases finding their way quickly enough in sufficient quantity into the fourth compartment to kill as rapidly as they did. Photographs taken soon after the train was divided show clearly the

quantity of gas being produced and forced along the corridor in the direction of the wind.

Remarks and Recommendations

This part of the report also is necessarily lengthy. It deals with technical questions relating to the ways in which such fires can start smouldering and building up high temperatures, so leading to a sudden explosion. An interesting point was the way in which the 4-in. plate glass of the windows was able to withstand these temperatures, probably due to the rise being gradual. This fire was of an unusual type to occur in a train, and several unrelated factors had to coincide. It was extraordinary that nobody walking by noticed signs of fire. Three persons passed the burning compartment—one of them twice—and failed to do so, probably because the smouldering was under a seat and inside the upholstery. The well-fitting doors and windows prevented smoke from percolating.

In considering how such fires could be avoided, Colonel Walker examined similar coaches. All had been well cleaned but, mostly there was a greater or lesser amount of dust and so on, and material that could smoulder for a long time collected under the seats, where it was extremely awkward to clean because the heaters, 3 ft. long, are raised only 1 in. from the floor and the seats are not removable. This design is considered not satisfactory and it is recommended that it be improved in all future coaches. The simplest and most effective way of doing this is to make the seats removable. Any disadvantages would be outweighed by the ability to clean thoroughly underneath them. If not feasible on existing coaches, special cleaning measures should be adopted. Unprotected deal board partitions involve unnecessary fire risk, but it has now been decided to apply asbestos board and fix a wire mesh grill to limit entry of rubbish. Without removable seats this is insufficient, and, Colonel Walker considers, would lead to dust collecting where it could not be reached.

The report pays a tribute to the passengers who, without thought for themselves, entered the compartment and so lost their lives, and the railway staff, such as the trainmen and ganger, receive high praise for their quick and effective action. The assistance of numerous experts, fire brigade officers, fire research staff and others is gratefully acknowledged.

Fire Precautions in Coaches

The report emphasises that to discuss the whole problem of coach design and relative merits of the different designs, such as all-steel, partly steel or wood, etc., would be a lengthy task, while a partial treatment would be misleading, but agrees with the decision not to adopt all-metal construction in Great Britain. Fire risk in itself is not sufficient reason for changing from a well-tried and generally satisfactory design. Nevertheless, as long as there is a wooden interior to a coach there will be the possibility of fire. If an all-metal coach is not adopted careful attention to design will be needed, with provision of means of rapid escape in emergency and adequate fire-fighting preparations. The details already referred to should receive consideration for existing coaches and designs for future stock.

The question of the use of clear cellulose lacquer, responsible for the fire at Penmachuel tunnel, is at the root of present public concern over fires in trains and is of major importance. Despite the difficulties,

energetic measures have been taken and the removal of this lacquer will be completed in about 12 months. No more than this could be expected. The coaches in the Beattock fire were finished in a matt lacquer, in use for 13 years past. This is not so sensitive to ignition as the clear type, but has a rapid flame spread. Although not the cause of the fire, nor of the deaths, it probably contributed slightly to the subsequent conflagration. The problem is not so urgent, but it is recommended that this lacquer be replaced in existing coaches, as soon as circumstances permit.

Means of Escape

The degree of acceptable fire risk depends largely on ease of exit from a coach and means of emergency escape. The provision of doors has varied from time to time as designs have changed; in 1939 the policy was to provide not only end doors in corridor stock but additional doors also in the corridors and cross-gangways. In the new standard design there will be at least one door or pair of doors between the end doors on the corridor side, but none in the compartments, and in third and composite coaches an intermediate door on that side, reached by a small transverse corridor. This gives ample emergency exit facilities but it remains to be considered whether there should be such means in the compartments themselves or existing means are sufficient.

The necessity for evacuating a compartment is greater in fire than any other kind of accident. As long as there are wooden interiors some emergency exit from one is desirable. In many coaches today exit would have to be made through the ventilators over the windows, or by breaking the latter. Women would almost certainly find it too difficult to break a window and there is considerable risk from jagged glass. If corridors are blocked the new standard compartments are by no means easy to leave, particularly in great urgency, but a practical remedy, not disproportionately affecting amenities and comfort, is not easy to suggest. The British structure gauge renders it necessary to curve carriage sides towards floor level, and the Continental straight window, lowering right down, is impracticable. It is recommended to study this and consider the provision of emergency exits in compartments having wooden or other inflammable interiors. Curved glasses, although much more expensive, and "toughened" glass, might be practicable.

Sleeping cars present a special problem in this respect, as their passengers are segregated and might not become aware of an emergency for a considerable time; also there is much interior woodwork and other inflammable material, such as bedding. There are a gas water heater in the pantry and two cylinders beneath the floor. It is possible that no one may walk through the corridor for several hours and a small fire might burn unnoticed all that time. Risk of fire and probable consequences are greater than in ordinary coaches. In the cars in use there is no means of escaping if the corridor is blocked, save by breaking windows, and as many as four persons might have to climb out. If the corridor is not blocked exit is through the two end doors, but were one end blocked all would have to make their way down the narrow corridor. Experience shows how difficult it is for even one or two to reach the end through smoke and fumes. Narrowness adds to the difficulty of breaking windows.

Colonel Walker considers that sleeping cars, particularly third class holding up to 28 passengers, are not sufficiently provided

with means of escape and that this should be rectified in new cars. An intermediate door in the corridor is needed also, and in compartments there might be windows to lower fully, perhaps with curved glass, or which could be discarded in emergency. This should be considered in the new open centre corridor coaches, designed for 64 passengers and provided with two doors each end. If one end were blocked there might be an uncontrolled rush to the other, as happened at Westborough, seriously aggravating the results of the fire.

Fire Fighting

General practice is to carry an extinguisher in every dining, kitchen and sleeping car and guard's van, although two former companies placed them in all corridor coaches, so that the Western and Southern Regions are still largely so equipped. There are various types, many of the soda-acid pattern. It has been decided recently that the water-CO₂ pattern is more suitable because it does not corrode and is easier to work and maintain. The CO₂ gas or foam types are used in kitchen, dining and sleeping cars where there is electric power. To eliminate waste of precious time it is recommended that as long as there are wooden interiors there should be an extinguisher in every corridor coach as well as in the vehicles now provided with them.

Train crews and dining-car staffs are to be instructed in the use of hand extinguishers, and demonstrations are being given. This should be regularly continued. A standard procedure would be advisable, to be adopted in the event of fire, so that each man would know exactly what he had to do. Smoke and fumes travel quickly and dangerously through the corridors of a whole train, threatening to overcome people or cause panic in coaches far removed from the fire.

It might be advisable to ensure that gangway doors adjacent to the fire are closed as soon as possible, after confirming that nobody remains inside. Perhaps a man could be made responsible for looking after passengers and keeping them informed of what is occurring. Two passengers at Beattock said they felt no one was in charge, or knew what was happening, but probably were on the side of the train where they could not see what was being done. Some confusion was to be expected, but it might be prevented in future if a man were detailed to deal with it.

Colonel Walker has nothing but praise for the way in which all handled a difficult situation at Beattock. His recommendations are intended, "not as a criticism of the new coach designs which, on the contrary, represent a notable advance in several ways, including safety, but as an indication of the directions in which fire protection improvements could, and in certain cases should, be made." There are many other factors to be taken into account, and the problems involved are far from simple. Responsibility for designing a safe and suitable carriage rests with the Railway Executive; the decision on what is best must also rest with it. These recommendations will cost money. Nevertheless, little imagination is needed to visualise the terrifying effect and possible disastrous results, of a rapidly spreading fire in the enclosed space of a moving carriage. Though a serious case, involving fatal or injurious results, has only occurred four times in the past fourteen years, the hazard should not be considered small on that account: risk is always present, and consequences certainly not negligible. So long as there is risk, and there are reasonable steps to remove or mitigate it, they should be taken.

Reorganisation of the South Eastern Division, R.H.E.

To bring all long-distance traffic in and out of the Metropolitan Area of the South Eastern Division of the Road Haulage Executive under one control and operate it directionally, the Executive is reorganising it on a functional rather than a geographical basis.

The groups within the area are being placed under three functional managers in charge of directional services, general services, and contracts. Groups outside the Metropolitan Area but within the South Eastern Division are being placed under the control of an officer styled the District Manager, Home Counties District.

The first stage, the re-allocation of Groups to the responsibility of the new managers, takes effect on May 20. Stage two, for which no time limit is set, is a gradual re-allocation of depots, vehicles, and traffics to the three services. Stage three, the completion of the reorganisation, will take at least six months.

Existing Depots Used at First

The new districts will initially operate from existing depots, but it is expected that Directional Services will early require larger properties. Headquarters has taken over the responsibility of negotiations with the Railway Executive to secure available sites.

A plan for the separate control of parcels and smalls traffic within the South Eastern Division has already been approved by headquarters. The traffic will be controlled by a functional manager with the title of London Parcels Manager; directly responsible to him will be managers for each of five areas.

The Small Metropolis Area will control all smalls traffic as distinct from parcels in the Metropolitan Area; three Parcels Areas will control all parcels traffic throughout the Division; and the Import & Export, Trunk Pool, and Cartage Services will control shipping traffic, provide trunk service vehicles and control the cartage and transfer services which operate within the Division.

Coaling and Ash Disposal Plant at Dunfermline

A further stage has been reached in the scheme of improved facilities for the speedy turnaround of locomotives at the Dunfermline Motive Power Depot in the Scottish Region to meet present-day requirements and also to provide for the increasing traffic arising from the extending Fife and Clackmannan coalfields.

Construction has been completed recently of a new electrically operated mechanical coaling plant of 200 tons capacity, the installation of an electrically operated ash disposal plant, and new ashpits, these important new works now being in full operation.

The work was considerably hampered and delayed in the early stages of the work because of running sand and soil difficulties which were encountered when excavating for foundations of the mechanical ash handling plant.

A further much needed improvement is the provision of a 70-ft. turntable for locomotives which will be equipped with a vacuum tractor for turning the locomotives. Substantial progress has been made in the construction of this turntable, but it will be some months yet before it is in operation. It was necessary to divert a large drain before construction work could be

started and now the necessary piled foundations are being provided.

The comprehensive scheme of new mechanical equipment at the Dunfermline Motive Power Depot not only incorporates the replacing of an old type of manual locomotive coaling stage by the latest electrically operated plant, the replacing of old-fashioned means of locomotive ash disposal by a modern electrically powered ash elevator, and the provision of a new locomotive turntable, but also includes general improvements to electric lighting throughout the depot and electric drive for the machine tools.

The contractors for the coaling and ash disposal plants were Henry Lees & Co. Ltd., Motherwell, and for the 70-ft. turntables, ashpit, retaining walls, and so on, the firm of Ivan Tait, Edinburgh.

Joint Engineering Conference in London

A joint engineering conference will be held at the Institution of Civil Engineers, the Institution of Mechanical Engineers, and the Institution of Electrical Engineers from Monday, June 4, to Friday, June 15. The conference will be opened by the Lord President of the Council in the Great Hall of the Institution of Civil Engineers at 3 p.m. on June 4. Technical sessions will be held during the mornings and some afternoons at the three Institutions and an interesting programme of works visits and social functions has been arranged.

Advance copies of the papers to be read, which will cover a wide field, together with the full conference programme, may be obtained from the office of the Secretariat at the Institution of Civil Engineers, Great George Street, London, S.W.1, and after the conference the papers, together with the discussions, will be printed in eleven separate parts: 1. Formal proceedings and general summary. 2. Railways. 3. Sea Transport. 4. Power. 5. Aviation. 6. Engineering education and practical training. 7. Road transport. 8. Telecommunications. 9. Public health in municipal engineering, water supply, and sewerage. 10. Gas industry plant, mining, and steelworks plant. 11. Electric measurements, television, cables, lighting, and mining.

Papers on Railway Subjects

On June 5, at 10 a.m., papers will be read at the Institution of Civil Engineers on Railways (Civil Engineering) by Lt.-Colonel H. B. Everard, Chief Officer Engineering (Maintenance), Railway Executive, on the subject of "Permanent Way Developments in Great Britain"; by Mr. D. Anderson, of Messrs. Mott, Hay & Anderson, Consulting Engineers, on "Underground Railway Planning and Construction"; and by Mr. J. S. Campbell, Assistant (Bridges) to the Chief Officer, Engineering (Works), Railway Executive, on "Railway Bridges."

On the following day, June 6, Mr. R. A. Riddles, Member of the Railway Executive, will present a paper entitled "Railway Mechanical Engineering," at the morning technical session starting at 10 a.m.; while on June 7 at 10 a.m. Mr. C. M. Cock, formerly Chief Electrical Engineer, Railway Executive, and now General Manager, Traction Department, English Electric Co. Ltd., will deal with the subject of "Electric Traction and Signalling."

The subject of engineering education will be dealt with during the morning session at the Institution of Civil Engineers on June 13. Professor J. F. Baker will read a paper entitled "The Development and

Trend of University Education in Engineering" and Dr. H. L. Haslegrave will deal with "The Contribution of the Technical Colleges." The same afternoon Mr. H. J. B. Harding will speak on "The Practical Training of Civil Engineers" and Sir Arthur P. M. Fleming on "The Practical Training of Mechanical and Electrical Engineers."

Works visits will include the Battersea Power Station of the British Electricity Authority, the electrical switchgear works at Willesden of the British Thomson-Houston Co. Ltd., the C.A.V. Limited works at Acton, the Wembley lamp factory of the General Electric Co. Ltd., the coach repair works of the London Transport Executive at Chiswick, and the L.T.E. underground railway repair works at Acton, the A.E.C. Limited works at Southall, the Erith works of British Insulated Callender's Cables Limited, and the Woolwich works of Siemens Bros. & Co. Ltd.

Parliamentary Notes

British Transport Commission Bill

The British Transport Commission Bill was read a second time in the House of Lords on May 9.

Helicopter Station at Charing Cross

Mr. N. N. Dodds (Dartford—Lab.) on May 9 asked the Parliamentary Secretary to the Ministry of Civil Aviation, in view of the development of a twin-engine helicopter, what consideration would be given to siting a helicopter passenger station over Charing Cross Railway Station.

Mr. Frank Beswick (Parliamentary Secretary to the Ministry of Civil Aviation) said that, provisionally, cross-country helicopter services were considered by the Government to be more urgent than those radiating from London. He would, however, be glad to discuss the matter.

Questions in Parliament

Fares for Service Personnel

Major John Morrison (Salisbury—C.) on May 4 asked the Minister of Defence what were the special rates for rail transport for Service personnel agreed between the Service Departments and the B.T.C.

Mr. E. Shinwell, in a written answer, stated: The special rates for Service personnel traffic agreed between the Service Departments and the railway companies under Section 6 of the Cheap Trains Act, 1883, have been in operation since December, 1932. The rates are based upon the payment of half the public fare in respect of a single journey, and the full public fare for a single journey in respect of a return journey. As a matter of accounting convenience, the railway regions now charge the Service Departments an average fare for each journey irrespective of the distance.

Passenger Fares

Mr. Leslie Hale (West Oldham—Lab.) on May 7 asked the Minister of Transport whether he was aware of the hardship which an increase in passenger fares would cause to many sections of the community.

Mr. Alfred Barnes stated in a written answer: I assume that Mr. Hale has in mind the proposals in the draft passenger charges scheme which the B.T.C. has submitted to the Transport Tribunal. The actual levels of fares under the scheme will not be known until it has been settled by the Tribunal after a public inquiry. The

intention of the Transport Act is that users of the services provided by the Commission should pay an economic price for them, and I see no justification for departing from this principle.

Transport Charges Scheme

Mr. A. Edward Davies (North Stoke-on-Trent—Lab.) on May 7 asked the Minister of Transport whether he would formulate an interim transport charges scheme prior to the introduction of the full scheme as required under the Transport Act, 1947; and, if so, when it would commence to operate.

Mr. Alfred Barnes: No. I have no power to formulate charges schemes under the Transport Act. The duty of preparing draft schemes and of submitting them to the Transport Tribunal for confirmation is placed by the Act on the B.T.C.

Railway Employees' Gratuities

Mr. William Bennett (Woodside, Glasgow—C.) on April 26 asked the Chancellor of the Exchequer if the Treasury made an assessment for income tax purposes on gratuities earned by railway employees.

Mr. Douglas Jay (Financial Secretary to the Treasury) in a written answer stated: These gratuities are liable to income tax under the law and the Inland Revenue takes steps to secure that tax is charged accordingly.

Concessions to Government Departments

Major John Morrison (Salisbury—C.) on April 26 asked the Financial Secretary to the Treasury what was the total amount, and the individual amounts for each chief Department of State, paid to the B.T.C. in 1950-51 for rail transport of civil servants on official business, and to what extent that traffic was paid for at special rates.

Mr. Douglas Jay stated in a written answer: Government Departments have, for many years, in the interest of economy made use of the concessions for bulk travel which operate, subject to certain conditions, also in the case of traders and their employees travelling on business.

First Aid Equipment in Trains

Captain Peter Thorneycroft (Monmouth C.) on April 23 asked the Secretary of State for the Home Department if he would consider amending his regulations to enable the B.T.C. to carry morphine in addition to first aid equipment in all trains.

Mr. Geoffrey de Freitas (Parliamentary Under Secretary of State for the Home Department) in a written answer to this question stated: No.

Steel Supplies

Mr. Maurice Edelman (North Coventry—Lab.) on April 23 asked the Minister of Supply (1) what was the present short-fall of American sheet-steel deliveries to Britain, and (2) what representations he had made to the American suppliers of sheet-steel on contract to Great Britain to ensure that supplies were delivered as contracted.

Mr. George Strauss (Minister of Supply), in a written answer, stated: The present shortfall in deliveries of steel sheet from the U.S.A. is 19,500 tons. In addition, orders have been placed for 30,000 tons of hot rolled coil for delivery between now and the end of the year. The orders are commercial transactions between the British Iron & Steel Corporation and individual steel companies in the United States and I have therefore made no representations to the suppliers.

Mr. Maurice Edelman also asked whether the Minister would make representations

to the International Materials Conference to assure that steel supplies produced by its members are fairly allocated.

Mr. Strauss stated in a written answer: No. The main difficulties arise from shortage of particular materials used in steel-making and certain studies in this field are already being carried out by the International Materials Conference in Washington and by other bodies.

Contracts & Tenders

The order for 22 third class coaches and two spare bogies which, as recorded in our April 6 issue, has been placed with the Metropolitan-Cammell Carriage & Wagon Co. Ltd. by the Egyptian Government, has been increased to 48 coaches and four spare bogies. As revised the order is for 24 vehicles with buffet compartments and 24 with brake compartments.

The Queensland Government Railways have recently placed the following contracts:—

Gloucester Railway Carriage & Wagon Co. Ltd.: 500 four-wheel low-side wagons, type "FJS."

Metropolitan-Cammell Carriage & Wagon Co. Ltd.: 1,000 four-wheel low-side wagons, type "FJS."

The English Electric Co. Ltd.: 10 Co-Co diesel-electric locomotives. The total running weight will be 90 tons and maximum axle load 15 tons, and the locomotives will have a 12-cylinder "V" engine, supercharged, designed to develop 1,500 b.h.p. at altitudes not exceeding 500 ft. and at temperatures not exceeding 85° Fahrenheit.

Australian General Electric Pty. Ltd.: 10 diesel-electric locomotives. The locomotives will be manufactured by the General Electric Company of America.

British Railways, London Midland Region, has recently placed the following contracts:—

Dawsons Limited, Battersea, S.W.11., for structural steelwork at Cricklewood carriage sheds.

Harland & Wolff Limited, North Woolwich, London, S.E.16, for the supply, delivery and erection of the steelwork for a new roof covering over the main store and metal stores, and new chain store, at Bow locomotive works.

British Challenge Glazing Co. Ltd., Stratford, E.15, for the re-covering of the roof with patent glazing at Queens Park Station.

W. H. Heywood & Co. Ltd., Westminster, S.W.1, for patent glazing in connection with the re-covering of Southport Chapel Street Station roof.

Robertson Building Service, the Wolverhampton Corrugated Iron Co. Ltd., Ellesmere Port, Wirral, Cheshire, for protective metal sheeting in connection with the re-covering of Southport Chapel Street Station roof.

C. & T. Painters Limited, Harlesden, N.W.10., for labour for the cleaning and painting of the roof over platforms 1-8 of Broad Street passenger station.

Demolition & Construction Co. Ltd., S.W.1, for the removal of the existing covering, provision of fire resisting safety sheets, cleaning gutters, erecting barriers and temporary protection in connection with the re-covering of Liverpool Exchange Station roof.

It has been stated in the Board of Trade, Commercial Relations & Export Department, Special Register Information Service that the United Kingdom Trade Commissioner at Delhi has reported that the Director General of Supplies & Disposals, Railway Stores Directorate, New Delhi, has issued a call for tenders for the supply of the following equipment:—

Brake Beam B.G. Complete to I.R.S Drawing No WA-139 alt. 3. 540

Beam Vacuum Brake (Wagons) to B.N.R. C.M.E. Drawing No. 7867 (D.G.I. & S. No. 2015) 200

Beam Vacuum Brake (Carriages) to B.N.R. C.M.E.'s Drawing No. 7849 item B (D.G.I. & S. No. 2014). 200

Tenders should reach the Director General of Supplies & Disposals by 4 p.m. on June 14, 1951. A copy of the tender documents is available for inspection by representatives of United Kingdom manufacturers at the Commercial Relations & Exports Department, Board of Trade, London, S.W.1.

Presentation to Mr. A. Lane



Mr. A. Lane, who retired recently as Chief of Police, South Western Area, British Transport Commission, receiving a presentation from Mr. K. W. C. Grand, Chief Regional Officer, Western Region, on May 8

Notes and News

Locomotive Draughtsman Required.—An experienced locomotive draughtsman, about 35 years of age, is required by the Yorkshire Engine Co. Ltd., Sheffield. See Official Notices on page 571.

Works Manager Required.—A works manager, familiar with locomotive repair and maintenance, including boiler repairs and rebuilding, is required for the South of Spain. See Official Notices on page 571.

North Eastern Region Cup Final Specials.—For the F.A. Cup Final between Newcastle United and Blackpool, at Wembley on April 26, the North Eastern Region ran 18 special trains. The 16 trains which ran from Tyneside carried 7,675 passengers.

Indian Train On Fire.—It is reported that four persons were burnt to death and 10 injured when a coach of a Calcutta-Bombay mail train caught fire on May 11 at Bilaspur, about 250 miles from Nagpur. The cause of the fire is not yet known.

Works Manager (Deputy General Manager) Required.—A works manager (deputy general manager) between 36 and 48 years of age, is required for a large overseas works engaged in steam locomotive and other heavy engineering construction. See Official Notices on page 571.

German Exports to Hungary Cancelled.—According to an agency message the West German Government has cancelled export to Hungary of 4,050 tons of rails. A total of 1,050 tons on 75 railway wagons is held at Furth-am-Wald, near the Czech-German frontier. Another 250 wagons, carrying the other 3,000 tons of rails, were

intercepted and turned back by Government officials at Nuremberg and Osnabrück. The Economic Affairs Office of the American High Commission in Germany said the consignment was properly licensed by a West German licensing agency, but it is stated Allied and German authorities took this action because the shipment was deemed inadvisable.

Foreign Railways Investment Trust Limited.—The name of the Foreign Railways Investment Trust Limited is to be changed to Caledonia Investments. Application has been made to the London Stock Exchange for permission to deal in and quotation for £596,326 "A" preference stock and it is proposed to consolidate the "A" and "B" ordinary stock into a single class of £1,500,000 ordinary stock.

Hartlepools Docks Improvement.—The British Transport Commission has approved a recommendation of the Docks & Inland Waterways Executive for the reconstruction of the lightening berth at the Old Harbour, Hartlepools Docks, at an estimated cost of £330,000. When completed, the scheme will provide modernised accommodation and facilities for the larger ships now being used for the conveyance of timber and iron ore—the two principal trades at Hartlepools Docks—and will facilitate the turnaround of the vessels.

Stephenson Locomotive Society.—Following a successful tour of railways in the Glasgow district last year, the Stephenson Locomotive Society held the first of two similar outings on April 28. The tour started from South Queensferry, near Edinburgh, at 2.30 p.m. and the journey to Glencorse was via Dalmeny Junction.

Danish Royal Visit to London



Mr. C. P. Hopkins, Chief Regional Officer, Southern Region (centre), accompanied by Mr. Chapman, Stationmaster, Victoria (left), receiving Princess Elizabeth at Victoria Station on May 8, on the occasion of the State visit of the King and Queen of Denmark

Kirkliston, Ratho (Lower), and George Junction. On the return journey from Glencorse the route was via Millerhill, Niddrie South Junction, Portobello, Pierhill Junction, Lochend Junction, and London Road Junction to Edinburgh (Waverley), where the party of about 100 passengers detrained at 5.7 p.m. The Society is sponsoring a further tour on September 1 in the Paisley-Barrhead-Johnstone districts, over sections of the former Caledonian and Glasgow & South Western Railways.

London Transport Coaches for London Tours.—The first of the new "RF" type sightseeing coaches were put into service by London Transport on Whit Monday on City and West End and London River tours. These coaches are equipped with loudspeakers and hand microphones for use by guides. Eight of these tours will operate from Victoria Coach Station throughout the summer.

Churchill Machine Tool Co. Ltd.—The trading profit and other income of the Churchill Machine Tool Co. Ltd. amounted in 1950 to £408,269 as compared with £291,759 in the previous year. General reserve takes £20,000, which is the same as for the previous twelve months, while plant and replacement reserve takes £100,000 against £50,000. A sum of £49,185 is carried forward as compared with £50,702 in 1949.

Weed Killing Train in Action.—The London Midland Region of British Railways has just begun an all out attack on weeds by sending out its special train to tour the track. It will spray over 100,000 gal. of solution as it moves along. The train comprises an engine, tank wagons containing weed killer, sleeping and dining coaches for the staff, and a set of six adjustable self-cleaning jets giving umbrella sprays in the form of rain. The maximum speed of the train is 25 m.p.h.

Scottish Region International Football Traffic.—For the international football match at Hampden Park, Glasgow, on May 12, between Scotland and Denmark, the Scottish Region of British Railways ran a special service of trains from Glasgow Central Station to Mount Florida every few minutes from 1.40 until 2.40 p.m., returning from Mount Florida after the match. Specials were also run from Greenock, Port Glasgow, Johnstone, and Paisley direct to Mount Florida, and from Hamilton, Coatbridge, Bellshill, Wishaw, Motherwell, and other stations in Lanarkshire direct to King's Park.

North Eastern Region First Aid Finals.—On May 5, the finals of British Railways' North Eastern Region, First Aid Competition for 1951 took place in the Railway Institute, York. Eliminating contests between teams in the nine Districts throughout the Region had previously been held, and at the finals, which included individual as well as team tests, the winners were the Dewsbury Team, with York C. & W. No. 1 Team runners up. Other teams taking part in the final contest were from Wakefield, Bradford, Starbeck, Middlesbrough, Darlington and Newcastle. Mr. H. A. Short, Chief Regional Officer, presided at the distribution of the awards and the presentations were made by Mrs. Short.

Dunlop Rubber Co. Ltd.: Increase in Profits.—The Dunlop Rubber Co. Ltd. announces that, subject to completion of audit, the consolidated operating profit of the group for 1950, before tax payment, was £17,620,116, against £9,480,850. The

OFFICIAL NOTICES

JUNIOR Traffic Officials with railway traffic apprenticeship experience. Age about 25, single, required for service on railways in Peru and Bolivia. Apply to the Secretary of THE PERUVIAN CORPORATION LIMITED, 144, Leadenhall Street, London, E.C.3.

FOR SALE—10 tons $3\frac{1}{2}$ in. \times 1 in Hexagon Bolts and Nuts; 10 tons 3 in. \times $\frac{1}{2}$ in. Countersunk Round Hexagon Bolts and Nuts; 30 cwt. 2 in. \times $\frac{1}{2}$ in. ditto; 15 cwt. 1½ in. \times $\frac{5}{16}$ in. ditto. All in new condition.—Write Box 84, *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiments. Eight single-acting cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945, Price 2s. Post free 2s. 3d. *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

1950 figures include the operating profit of subsidiaries in Germany and Japan. After crediting abnormal items and charging depreciation, the group net profit before tax was £13,754,753, as compared with £6,327,995. The ordinary dividend is 15 per cent., plus a bonus of 2½ per cent., on capital as recently increased by the issue of 13,412,837 new ordinary shares of 6s. 8d. at 13s. 4d. a share. For 1949 the dividend was 12 per cent. and the bonus 3 per cent.

Three-Head Locomotive Frame Slotter for India.—In our April 20 issue there was a description of a locomotive frame slotter manufactured by Craven Bros. (Manchester) Ltd. for the Indian Government Locomotive Works at Chittaranjan. The general proportions and design features of this machine were developed by Craven Bros. (Manchester) Ltd. in collaboration with, and to the inspection of, the Consulting Engineers, Messrs. Rendel, Palmer & Tritton.

North Eastern Region Whitsun Trains.—A feature of the 226 special excursion trains in the programme of the North Eastern Region of British Railways for Whitsun was that 35 of them were "guaranteed and private" provided sufficient passengers were forthcoming. In this category there was a pilgrimage train on Sunday from Leeds and the West Riding to Holywell, North Wales; five special trains carried girl guides to Durham for a rally; and an excursion ran from Newcastle to Northern Ireland. Other special excursions included 118 to the seaside, 23 to race meetings, and 50 from town to town. A total of 317 special trains was run during the holiday period and seat reservations were provided on 21 relief trains.

Scottish Seed Potato Traffic.—Nearly 360,000 tons of seed potatoes were loaded at stations in Scotland from the start of the season until the end of April. Traffic originated mainly north of the Forth, while the heaviest volume of despatches was concentrated in the Perth area, the principal stream being to Lincolnshire and the Eastern Counties of England. Over 300 special trains with bulk loads were run via the East Coast route to the Eastern Region for distribution from Whittemoor, Peterborough, and Spalding, while other special services were provided to Lincoln, Boston, and Doncaster, and to Wales and the West of England, via Carlisle. Six special trains, with seed potatoes specially packed and boxed for export to South Africa, were run to Southampton, and one to Merseyside. Bad weather conditions adversely interfered with the dressing of

REQUIRED: Works Manager (Deputy General Manager) for large overseas works engaged in steam locomotive and other heavy engineering construction. Applicants should have held senior executive positions in large heavy engineering workshops and have had experience in all aspects of works management. Age between 36 and 48. Good pay and prospects for suitable man. Write in confidence giving details of education, experience, with present emoluments and salary required to Box 4211, c/o CHARLES BARKER & SONS LTD., 31, Budge Row, London, E.C.4.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium svo. Full cloth. Price 20s. By post 20s. 6d. *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

the crop and thereby caused disruption in the normal movement of traffic. Therefore heavy forwardings were handled towards the end of the season and the despatch of approximately 200,000 tons was concentrated into the period from February to April.

Road Accidents in March.—Ministry of Transport returns show that road casualties in Great Britain in March totalled 16,442, including 404 killed and 4,027 seriously and 12,011 slightly injured. The March figures for the first time since the war exceed the total for the last corresponding month before the war (March, 1939) which was 15,854. The increase is probably due to the incidence of Easter in March, whereas in 1939 it fell in April.

Derwent Valley Light Railway Company.—The accounts of the Derwent Valley Light Railway Company for the year ended December 31, 1950, show a total tonnage of 93,922 or a decrease of 8,901 tons as compared with the previous year. Traffics showing increases included sugar beet, 11,695 tons against 7,461 tons, and potatoes 4,001 tons against 3,847 tons. Gross receipts were £19,765, against £23,390, and expenditure £16,124 as compared with £17,835. The net revenue for the year was £9,660, and, after adding the balance brought forward of £1,924 and deducting interest paid on debenture stock,

EXPERIENCED Locomotive Draughtsman required for Yorkshire Engine Co. Ltd., Sheffield. Age about 35. Give full particulars of training and experience.

WANTED for South of Spain: Assistant Works Manager. Applicants must be thoroughly familiar with locomotive repair and maintenance, including boiler repairs and rebuilding. Salary £750 per year and free housing. Applicants should state whether married or single, and if married, number and ages of children. Write giving full details of education and experience to Box 1,924, c/o STREETS, 110, Old Broad Street, London, E.C.2.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth, 8½ in. by 5½ in. 82 pp. Diagrams. 5s. By post 5s. 3d. *The Railway Gazette*, 33, Tophill Street, London, S.W.1.

£1,665, there remained £9,919. A dividend of 5 per cent. is to be paid on both the preference and ordinary shares and £3,000 is to be placed to general reserve.

Finals in Western Region First Aid Competition.—The teams which gained the first nine places in the semi-finals of the Western Region First Aid Competition competed in the Final Competition held in the Porchester Hall, Paddington, on May 1. The tests were set by Doctor R. A. Dench, Doctor W. L. M. Bigby, and Doctor C. T. Newham, and a large number of spectators, including Officers of the Railway Executive and the Western Region, witnessed the contest. The subsequent presentation of prizes and trophies was presided over by Mr. K. W. C. Grand, Chief Regional Officer, and the presentations were made to the winning team by Mrs. Grand. The result of the test was as follows: Swindon "A" (Winners of Challenge Shield), 529; Bristol D.O.S.O. (Winners of Carvell Cup), 52½; Taunton, 471; Newport "A," 466; Hereford Barton, 444; Cardiff Docks, 440; Barry, 436½; Ystalyfera, 433; Banbury "A," 426½. The Henry Butt Bowl was presented to the Banbury "B" team, which secured the highest position in Class 2 in this year's competitions. A vote of thanks to the adjudicators, patients and other helpers was proposed by Mr. R. Burgoyne, Regional Staff Officer, and to Mr. and Mrs.



Mrs. Grand presenting the Challenge Shield to Swindon "A" team in the Western Region first aid competition (see paragraph above)

Grand by Mr. J. R. Dixon, Captain of the winning team. The Swindon "A" and Bristol D.O.S.O. teams are representing the Region in the British Railways & London Transport (Railways) National Competition, which is being held in the Central Hall, Westminster, today, May 18.

Lightalloys Limited: Dividends.—The directors of Lightalloys Limited have declared an interim dividend of 3d. a share less income tax.

Central Uruguay Railway Company of Monte Video Limited.—A general meeting of the members of the Central Uruguay Railway Company of Monte Video Limited will be held at River Plate House, 12-13, South Place, E.C.2, on May 29, at 12.15 p.m. The meeting will have an account laid before it showing how the winding-up has been conducted during the year ended February 23, 1951, and hear any explanations that may be given by the liquidators, and will fix the remuneration of the liquidators.

London Transport Central and Metropolitan Line Mishaps.—Following a failure at Mile End substation the London Transport Executive Central Line was closed east of Liverpool Street from 11.05 a.m. on May 15. Twenty-three stations were affected and normal service was restored at 12.52 p.m. The following day two cars of a northbound train travelling on the Metropolitan Line became derailed between Kilburn and Willesden Green and fouled both northbound tracks; there were no injuries.

Craven Bros. (Manchester) Ltd.—Mr. J. R. Greenwood, Chairman of Craven Bros. (Manchester) Ltd., stated at the recent annual meeting of the company that profits on operations during the year ended December 31, 1950, were £195,226, an increase of £68,538 on the corresponding profits for last year, and, after allowing for taxation provision of £13,610 written back last year, the increase for the year was £54,928. The meeting declared a final dividend on the ordinary stock of 10 per cent., less tax, making 15 per cent. for the year, leaving a balance of £50,302 to be carried forward, thus making the carry-forward to next year £295,034. The report and accounts were adopted.

Forthcoming Meetings

- May 18 (Fri.) to 23 (Wed.).—Permanent Way Institution, annual summer convention at The Hague, Holland.
- May 18 (Fri.) to 23 (Wed.).—Railway Students' Association, London School of Economics & Political Science, annual convention in Paris.
- May 19 (Sat.).—Irish Railway Record Society visit to Dundalk Works, G.N.R. (I.).
- May 22 (Tue.) to 24 (Thu.).—Institution of Locomotive Engineers, summer meeting.
- May 23 (Wed.).—Road Haulage Association annual luncheon at Grosvenor House, Park Lane, London, W.1, at 12.30 for 1 p.m. Principal guest, Viscount Swinton.
- May 23 (Wed.).—Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 5.30 p.m. "Hydro-Electric Power Development in Scotland," by Sir Edward MacColl.
- May 27 (Sun.).—British Railways, Southern Region, Lecture & Debating Society, visit to the *News Chronicle*, at 9 p.m.

Railway Stock Market

A substantial business has again been transacted in stock markets, with the emphasis once more on industrial shares, buying being rather more selective than recently, with good gains among shares whose dividends are due to be announced during the next few weeks. The prevailing view is that the latter will include a large number of increases, but with markets in their present optimistic mood, expectations are often pitched too high. Results coming to hand show a substantial rise in earnings due in many cases to the big expansion in export market business last year.

The higher dividends which are now being paid generally require only a very small part of the net profits, and represent a policy of moderation because allocations to reserve are very substantial, frequently absorbing half the net profits. Results of Vickers give an illustration of current trends. Total group profits have risen further from £8,125,028 for 1949 to £9,055,675 for 1950, of which depreciation takes £1,174,469, taxation as much as £3,575,537, leaving net profits of £2,838,074 for 1950, compared with £2,712,193 for 1949. The dividend is raised from 6½ per cent. to 12½ per cent. and £3,323,804 goes to reserves. Total preference and ordinary dividends require £1,148,863, and £5,733,118 is carried forward, compared with £7,388,260 brought in. The dividend is now restored to the rate which ruled before the 100 per cent. share bonus which made good the capital cut suffered by shareholders many years ago when the capital was reorganised.

Foreign rails have been steady with movements generally small and unimportant. United of Havana 1906 debentures eased to 18½ and the other stocks of the company were also easier in the absence of any further news of nationalisation moves by the Cuban Government. Leopoldina Rails have not recovered from the recent moderate setback and the prevailing view is that it will still be some months before the take-over is finally completed and stockholders can receive their pay-out money. Nevertheless, current market prices are below expected pay-out levels, and market values will probably respond sharply when moderate demand for the stocks develops. Leopoldina ordinary changed hands around 10½, the preference was 26½, the

4 per cent. debentures 94½, and the 6½ per cent. debentures 140, while Leopoldina Terminal 5 per cent. debentures were 93½ and the ordinary units 1s. 3d.

Antofagasta ordinary and preference have been steadier at 7½ and 53½ respectively. The preference stock gives a generous yield on the basis of their fixed 5 per cent. cumulative dividend; bearing this in mind, and also the remaining arrears of dividend, this is, perhaps, the most attractive of the remaining stocks in the foreign railway market. Nitrate Rails shares were 22s. 6d. and Taltal shares 18s. 3d. Manila "A" bonds kept at 72½ and the preference shares at 7s. In other directions San Paulo 10s. units were 14s. 9d. and Brazil Rail bonds 4½. Bolivar "C" debentures were 58 and La Guaira ordinary stock 84½. Mexican Central "A" bonds were 63. Business around 44 has been marked in Chilean Northern 5 per cent. debentures. Canadian Pacific attracted a fair amount of profit taking which brought the price back to 55½. The 4 per cent. preference stock was 73½ and the 4 per cent. debentures 95.

There has been a good deal of business in engineering and allied shares helped by the good impression created by the financial results that have come to hand. Babcock & Wilcox at 82s. 3d. remained under the influence of the big profit increase and higher dividend, while Guest Keen at 63s. 3d. were again active on their increased payment and the special 5s. distribution arising from compensation for nationalised steel assets. T. W. Ward at 75s. 9d. reflected a little profit taking following their big rise. Vickers also came back after their recent spurt. The financial results and profit expansion created an excellent impression, but there was a little disappointment that the report makes no mention of how the compensation of over £15,000,000 for nationalisation of English Steel is to be dealt with. This is equal to about 25s. per £1 ordinary unit in Vickers and there are hopes of a special return of some kind for shareholders. But negotiations for "hiving off" of certain English Steel assets are in progress, the outcome of which must apparently first be awaited. Beyer Peacock have changed hands around 32s., North British Locomotive were 20s. 4d., Vulcan Foundry 31s. 3d., Gloucester Wagon 17s. 4½d., Birmingham Carriage 40s., Hurst Nelson 62s. 6d., Charles Roberts £5, and Wagon Repairs 5s. shares 16s. 1½d.

Traffic Table of Overseas and Foreign Railways

Railway	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date	
			Total this year	Inc. or dec. compared with 1949/50		1950/51	Increase or decrease
South & Cen. America							
Antofagasta	811	4.5.51	£88,890	+ 28,750	18	£1,872,240	+ £731,170
Costa Rica	281	Mar., 1951	£462,742	+ 528,918	39	£8,838,481	+ £1,242,019
Dorada	70	Mar., 1951	34,235	- 14,231	13	108,108	- 18,363
Inter. Ctl. Amer.	794	Mar., 1951	\$1,204,336	- \$106,082	13	\$3,753,109	- \$25,546
Paraguay Cent.	274	Apr., 1951	4,551	/ 243,895	43	£74,776	/ £9,060,681
Peru Corp.	1,050	Apr., 1951	£7,726,000	+ 5,463,000	43	£76,397,000	+ £18,736,942
" (Bolivian Section)	66	Apr., 1951	£16,036,000	+ £5,871,500	43	£s. 126,503,000	+ £s. 28,991,336
Salvador	100	Mar., 1951	£236,000	+ £60,000	39	£1,563,000	+ £87,000
Taltal	154	Mar., 1951	£2,091,357	+ £308,104	39	£14,688,148	+ £2,461,284
Canada							
Canadian National	23,473	Mar., 1951	17,554,000	+ 2,599,000	13	£47,640,000	+ 8,750,000
Canadian Pacific	17,037	Mar., 1951	11,502,000	+ 759,000	13	£32,736,000	+ 5,010,000
Various							
Barsi Light*	167	Mar., 1951	33,150	+ 3,420	52	350,745	- 3,225
Egyptian Delta	607	10.10.50	18,245	+ 1,296	28	319,911	+ 24,005
Gold Coast	536	Feb., 1951	277,776	+ 42,991	48	2,852,499	+ 303,619
Mid. of W. Australia	277	Feb., 1951	39,170	+ 8,636	35	316,384	+ 74,289
South Africa	13,347	7.4.51	1,892,119	+ 422,781	1	1,892,119	+ 422,781
Victoria	4,744	Jan., 1951	1,990,981	- 9,278	31	-	-

* Receipts are calculated at £s. 6d. to the rupee.

† Calculated at \$3 to £1